REPORT OF THE ERIC PROJECT

TITLE:

Construction and Standardisation of Primary School Achievement Tests (PSAT) for pupils of grade VII in the State of Gujarat.

PROBLEM:

To construct and Standardize Primary School Achievement Tests to estimate the real capacity of seventh graders of Gujarat.

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I N T R O D U C T I O N

It has now been unanimously accepted to consider grades I to VII as a primary level, the grade VII being the terminal stage, as a matter of state educational policy in Gujarat. The Central Government is also very keen to have a new pattern of 7+5+3 all over the nation thus having grade VII as a terminal point for the first stage. Thus this grade has become a very crucial year of utmost importance in the new pattern. It is a turning point in the lives of VII gradeas as it is to be resolved at this stage whether they should continue the academic courses or should join some vocational courses available in the State. A prime need has, therefore, arisen to design some scientific instrument - a reliable and a valid tool - for estimating the capacity of a pupil to

undertake the next phase of schooling. The main objective of this project was, therefore, to construct and standardize Primary School Achievement Tests (PSAT) to estimate the real capacity of the seventh graders. This battery of subtests can play a vital role in the educational guidance and can be used as an entrance test for standard VIII in secondary schools of Gujarat. Of course, other relevant data should also be taken into consideration. Thus, the PSAT can go a long way towards reducing some of the frustrations of the teachers as well as the taught and failures that darken the lives of secondary school pupils.

BROAD OUTLINE OF THE PSAT

At the outset, it was decided to develop the PSAT of four subtests which would involve -

(a) attaching meaning to isolated words - Vocabulary test

(b) manipulating numbers and applying number concepts accurately in a computation situation - Routine Computation test

(c) comprehending the "sense" of a sentence read - Sentence Completion test, and

(d) solving quantitative problems - Mathematical Reasoning Test.

Thus this battery of four subtests would measure basic skills actually acquired by the pupils at the end of grade VII.

In other words, these subtests would measure "school-learned abilities" directly rather than through psychological characteristics or traits which afford indirect measurement of capacity for school learning.

The above inference has been based on two observations, (ETS, p. 5):

1. The best single predictor of how well a pupil is likely to succeed in his school work in the next phase is "how well he is succeeding in this phase".

2. A certain few school-learned abilities appear to be critical pre-requisites to subsequent steps in learning throughout the range of general education; they include skills in reading and in handling quantitative information.

The PSAT is, thus, basically different from IQ tests and scholastic aptitude tests. It makes no claims regarding the measurement of native ability or otherwise. Its sole purpose is, as mentioned earlier, to estimate the capacity of an individual to undertake the academic work of the next higher level of the educational ladder.

The PSAT is a verbal test and has been constructed on the pattern of the American School and College Ability Tests (SCAT) series developed by Educational Testing Service. It yields three types of scores:

a. V-Score (Verbal Score) based on subtests I and III

b. Q-Score (Quantitative Score) based on subtest II and IV

and c. Total Score based on all the four subtests.

The last one is not identical to the IQ because it does not evolve from the measurement of native intelligence. Rather, it connotes the measure of the "school-learned" or "developed" abilities.

USES OF THE PSAT

The PSAT will be useful in :

a. measuring specific developed abilities rather than abstract hard to explain psychological traits.

b. measuring ability which many investigators of educational aptitudes have found to be most closely related to success in school learning.

c. having useful and meaningful separate verbal, quantitative and total scores for guiding the pupil in the selection of his educational goal and course of studies.

d. establishing local norms for certain area as well as for some particular educational institution.

e. comparing different classes of the same school or different schools of a certain region.

f. adapting it to some other states of India by making necessary modifications in it.

Thus, it will be useful to the teacher, the guidance worker, the school administrator, the person conducting educational research, the parents of a pupil and the most important - the pupil-himself.

CONSTRUCTION OF THE PSAT

Preliminaries :

i. The revised course contents in Gujarati and Mathematics that were to be introduced from the year 1982 in the State of Gujarat at the grade VII were studied.

ii. The text books of Gujarati and Mathematics that were prescribed for the VII class examination were also studied and the changes that were to be introduced in the course content from the academic year 1982 were noted down. This meticulous study of text books made the research fellows fully conversant with the course content.

iii. One of the research fellows visited the test library at the N.C.E.R.T., New Delhi and studied different tests of similar type that were available there. The other research fellow studied similar types of tests available at the School of Psychology, Education and Philosophy, Gujarat University.

iv. Some primary school teachers who have already taught in VIIth grade for more than three years and some members of the staff at primary teachers training colleges were interviewed to know their expectations they were trying to achieve, in the form of specific objectives.

In the light of these four preliminary studies, different items on the four subtests were coined.

Different Try Outs :

A. In the beginning, the items were of open end type and were administered individually to ten pupils only, having different academic levels. The pupils were asked to read the item and solve it aloud so that their approach toward the solution could be fully understood. Sometimes it took more than six sittings of 40-45 minutes each for four subtests. This was really very painstaking work but it did pay its premium afterwards. During this informal tryout, some items were deleted, some new items were tried out, some were modified and some items were reworded to make it more easy to comprehend.

B. The selected items with an open end type were then administered in a group, to two classes. One class (N=43) was selected from a municipal primary school and the other (N = 37) was from a primary section attached to a secondary school, in Ahmedabad. The number of items in the subtests were 90 (Vocabulary), 75 (Routine Computation), 90 (Sentence Completion) and 75 (Mathematical Reasoning) respectively.

This tryout provided the necessary distractors for each item in all the four subtests. Of course, in some cases, the distractors had to be evolved anew. Percent passing for each item was calculated and on that basis, some items were deleted, some were reworded or modified, some items which seemed unsalvageable were replaced and the retained items in each subtest were rearranged tentatively.

C. The next tryout was carried out on 200 subjects with 75 (Vocabulary), 60 (Routine Computation), 80 (Sentence Completion) and 50 (Mathematical Reasoning) multiple-choice items in the four subtests, respectively. It was administered into two parts : (i) the first two subtests and (ii) the last subtests on two consecutive days, to two classes of VII each from two local average schools.

This run was carried out to select better items to have a more refined subtests for item-analysis in the next phase. The criteria taken into consideration for selecting the items were

(i) percent passing of each item (difficulty value)

(ii) choice of the distractors (distractor count)

and (iii) the content of the item - so far as possible no two items of the same type were to be retained - (heterogenous coverage).

The general instructions as well as specific instructions with illustrations and practice tests for the subtests were also refined.

8.

D. The fourth tryout (Item Analysis) : From the above three tryouts, the PSAT having 40 items in each subtest was evolved for item-analysis. The testing programme was already fixed up. But the disturbances that started all over Gujarat upset the whole programme. Most of the primary as well as secondary schools remained almost closed during the months of February to May 1981. Under these circumstances, the fourth run for item - analysis could not be carried out earlier than April 1981 and that tpo, such types of schools were to be selected where the courses of VIIth grade were more or less completed. This run could not be postponed for a later date (June 1981) as it would not have solved the problem of completing the courses for the pupils were mass-promoted and then, the whole schedule would have been upset as the final run for standardization could not have been carried out before March, 1982.

The sample selected for item analysis was thus selective one. The urban sample was selected from Gandhinagar, the Capital of Gujarat and Surat city. The semiurban as well as the rural sample was selected from districts of Ahmedabad and Surat. This run was carried out on 399 pupils of VII classes of twelve different schools.

Table 1 below shows the selection of the total sample for the purpose of item-analysis.

TABLE 1

SELECTION OF THE SAMPLE FOR ITEM-ANALYSIS

I) Area : Urban

Schools	Boys	Girls	Total	Cases discarded
(A) Jivan Bharati High School, Surat	30	20	50	-
(B) P.M.Bhakta Primary School, Surat	13	16	29	-
(C) Swaminarayan H.School, Gandhinagar	30	24	54	1
(D) Govt. Primary School, Gandhinagar	16	18	34	-
Total	89	78	167	1

II) Area : Semi - Urban

(E) B.A.B.S. High School, Bardoli	20	20	40	-
(F) Primary School, Bardoli	10	4	14	-
(G) Mayoor Primary School, Thaltej	24	16	40	-
(H) Thaltej Primary School, Thaltej	12	13	25	2
Total	66	53	119	2

III) Area : Rural

(I) Dindoli Basic School, Dindoli	11	12	23	1
(J) Primary School, Bharthana	18	10	28	2
(K) Prakash Vidyalaya, Rakhial	24	8	32	3
(L) Saraswati Vidyamandir, Keliavasna	11	9	20	1
Total	64	39	103	7
Grand Total (I + II + III)	219	170	389	10

While scoring these 389 answersheets, ten answersheets were to be discarded as they were either not fully responded or responded half-heartedly. The remaining answersheets were divided into three areawise groups - (i) urban, (ii) semi-urban and (iii) rural, as shown in Table 1 above. There were 167, 119 and 103 respective cases in these three groups.

As there were maximum number of subjects in the urban group, the additional nineteen answersheets were withdrawn at random from that group to have the total sample of 370 testees for item-analysis. For the selection of 100 cases each from both the ends to form 27 percent high and low groups, the pooling method was adopted. For this, instead of treating the total sample as one group, 27 percent extreme cases were selected separately from all the three areawise groups. Thus forty answersheets from the urban group, thirty two answersheets from the semi-urban group and twentyeight answersheets from the rural group were collected to get the total number of hundred as high and low groups. If this was not done, false item analysis values might have obtained. Specifically, all Highs would be from superior schools and socio-economic levels and the Lows would entirely be made up of backward classes. The discrimination index would then not be so much on the basis of ability, as on the basis of socio-economic level and tests biased against backward groups could have been developed. The pooling method used here, however, ensured that it was different levels of ability within each socio-economic group

that were the basis of selecting items and not the differences between these groups.

The item-analysis chart (Harper, et. al., 1962) was utilised to get difficulty and discrimination indices of each item. The correction - for - guessing (or correction-for-chance) formula was not applied here for the following reasons :

i. All the items were the multiple choice items, each of them having four alternatives. "Multiple choice items have proved to be most widely applicable. They are also easier to score than certain other forms and reduce the chances of correct guessing by presenting several alternative responses."* (Anastasi, 1976, p. 415). Greene (1957, p.174) also opines the same. "It need not be used with multiple choice items, having four or more alternatives, as the chance of making a correct guess is not great in such tests."

ii. The pupils were given very liberal time to attempt almost all the items in each subtest. They were asked to raise their hands when they finished each subtest. It was observed that more than nintyfive percent of pupils completed the last item in each subtest and hardly two or three slow pupils in each class could not complete some of the subtests. "A correction for guessing is usually applied where pupils do not have sufficient time to complete all items on the test and where they have been instructed that there will be a penalty for guessing". (Gronlund, 1976, p. 262). In the general instructions

to the pupils in the PSAT, the pupils were asked not to guess the answer and omit the difficult items which might be tried afterwards.

Table 2 (pp. 13-16) presents indices of difficulty and discrimination of all the items with the remark of accepting, omitting or rejecting them and a new serial order of selected items.

Twentyfive items from 40 items in each subtest were selected taking into consideration the difficulty and discriminative indices of the items as well as the even selection of the three distractors. Sometimes, there were crucial problems for selection of items. It was then decided to apply the following formulas to find out facility and discrimination indices (Harper, 1975 , pp. 68-71).

$$FI = \frac{R(U) + R(L)}{2E} \quad (100)$$

$$DI = \frac{R(U) - R(L)}{E}$$

where R(U) = The number of right answers in the upper group

R(L) = The number of right answers in the lower group

E = Number in extreme group (here it is hundred)

Facility and discrimination indices found out by these formulas of the selected items only have been presented in Appendix A.

It would be interesting to compare the indices of difficulty (facility) and discrimination found out by two different methods, presented in Table 2 and Appendix A.

TABLE 2

ITEM-ANALYSIS OF FOUR SUBTESTS

(A) Subtest 1 : Vocabulary

Sl. No.	Difficulty Index	Discrimination Index	Remarks	New Order	Sl. No.	Difficulty Ind	Discrimination Ind.	Remarks	New Order
1	.69	.40	A	1	21	.55	.35	A	19
2	.75	.30	0*		22	.58	.25	A	15
3	.65	.35	A	3	23	.61	.45	A	10
4	.69	.30	0*		24	.58	.15	0	
5	.65	.25	0		25	-.18	-.15	R	
6	.69	.20	0		26	.58	.40	A	16
7	.65	.20	0		27	.52	.30	A	20
8	.45	.15	0		28	.39	.25	0	
9	.75	.35	0*		29	.61	.30	A	11
10	.65	.35	A	6	30	.48	.15	0	
11	.35	.15	0		31	.50	.25	A	22
12	.58	.35	A	14	32	.61	.40	A	12
13	.69	.40	A	2	33	.50	.10	0	
14	.58	.20	A	17	34	.50	.30	A	23
15	.52	.15	0		35	.39	.25	A	25
16	.55	.30	A	18	36	.65	.30	A	5
17	.61	.35	A	7	37	.52	.25	A	21
18	.65	.25	A	4	38	.61	.40	A	13
19	.61	.30	A	8	39	.50	.30	A	24
20	.61	.45	A	9	40	.39	.05	0	

(B) Subtest 2 : Routine Computation

Sl. No.	Diffi. Ind.	Discri. Ind.	Remar-ks	New Order	Sl. No.	Diffi.. Ind.	Discri. Ind.	Remar -ks	New Order
1	.75	.30	A	1	21	.35	.05	0	
2	.69	.30	A	2	22	.39	.05	0	
3	.58	.25	A	10	23	.39	.05	0	
4	.69	.25	A	3	24	.39	.20	A	22
5	.69	.20	A	5	25	.45	.10	0	
6	.48	.15	0**		26	.35	.05	0	
7	.69	.25	A	4	27	.42	.10	0	
8	.61	.30	A	9	28	.35	.15	0	
9	.52	.15	A	13	29	.48	.10	0	
10	.65	.25	A	8	30	.42	.10	0	
11	.39	.15	0		31	.42	.20	A	20
12	.50	.15	A	16	32	.45	.25	A	21
13	.48	.10	0		33	.42	.15	A	19
14	.65	.40	A	6	34	.39	.20	A	23
15	.55	.30	A	11	35	.35	.20	A	24
16	.65	.30	A	7	36	.39	.15	0	
17	.52	.25	A	15	37	-.45	-.05	R	
18	.55	.25	A	12	38	.31	.25	A	25
19	.50	.15	A	14	39	.31	.15	0	
20	.50	.35	A	17	40	.45	.25	A	18

(C) Subtest 3 : Sentence Completion

Sl. No.	Diffi. Ind.	Discri. Ind.	Remar-ks	New Order	Sl. No.	Diffi. Ind.	Discri. Ind.	Remar-ks.	New Order
1	.82	.25	0*		21	.69	.20	0	
2	.69	.35	A	3	22	.75	.35	A	1
3	.82	.30	0*		23	.61	.25	A	10
4	.69	.35	A	4	24	.75	.30	0*	
5	.65	.40	A	6	25	.61	.35	A	11
6	.82	.30	0*		26	.58	.20	A	13
7	.82	.35	0*		27	.18	.05	0	
8	.52	.45	A	18	28	.39	.25	A	24
9	.69	.40	A	5	29	.45	.20	A	21
10	.75	.35	A	2	30	.61	.35	A	12
11	.65	.25	A	7	31	.55	.20	A	15
12	.75	.25	0*		32	.69	.25	A	
13	.65	.15	0		33	.55	.20	A	16
14	.65	.20	0		34	.58	.15	0	
15	.65	.30	A	8	35	.48	.20	A	19
16	.42	.25	A	23	36	.45	.35	A	22
17	.39	.30	A	25	37	.42	.05	0	
18	.61	.25	A	9	38	.58	.35	A	14
19	.48	.25	A	20	39	.31	.20	0	
20	.65	.10	0		40	.55	.20	A	17

(D) Subtest 4 : Mathematical Problems

Sl. No.	Diffi. Ind.	Discri. Ind.	Remar -ks	New Order	Sl. No.	Diffi. Ind.	Discri. Ind.	Remar -ks	New Order
1	.65	.30	A	1	21	.25	.30	0	
2	.58	.20	A	3	22	.45	.25	A	20
3	.55	.25	A	5	23	.35	.10	0	
4	.58	.25	A	4	24	.50	.25	A	15
5	.52	.20	A	11	25	.39	.30	A	22
6	.55	.25	A	6	26	.42	.30	A	21
7	.55	.40	A	7	27	-.18	-.25	R	
8	.50	.10	0		28	.39	.05	0	
9	.45	.20	A	18	29	.55	.40	A	10
10	-.31	-.05	R		30	.35	.20	A	25
11	.55	.25	A	8	31	.48	.20	A	17
12	.52	.30	A	12	32	.45	.15	0	
13	.45	.20	A	16	33	.39	.25	0	23
14	.45	.20	A	19	34	.31	.10	0	
15	.61	.30	A	2	35	.39	.20	A	24
16	.52	.30	A	13	36	-.31	-.10	R	
17	.52	.25	A	14	37	.42	.15	0	
18	.55	.35	A	9	38	.35	.20	0**	
19	.39	.05	0		39	.31	.10	0	
20	.48	.25	0**		40	-.25	-.05	R	

A = Accepted; 0 = Omitted; R = Rejected

* These items were omitted simply because to have harder items in that ⊘ subtest.

** These items were omitted simply because to have the items of varied type.

(D) Subtest 4 : Mathematical Problems

Sl. No.	Diffi. Ind.	Discri. Ind.	Remar -ks	New Order	Sl. No.	Diffi. Ind.	Discri. Ind.	Remar -ks	New Order
1	.65	.30	A	1	21	.25	.30	O	
2	.58	.20	A	3	22	.45	.25	A	20
3	.55	.25	A	5	23	.35	.10	O	
4	.58	.25	A	4	24	.50	.25	A	15
5	.52	.20	A	11	25	.39	.30	A	22
6	.55	.25	A	6	26	.42	.30	A	21
7	.55	.40	A	7	27	-.18	-.25	R	
8	.50	.10	O		28	.39	.05	O	
9	.45	.20	A	18	29	.55	.40	A	10
10	-.31	-.05	R		30	.35	.20	A	25
11	.55	.25	A	8	31	.48	.20	A	17
12	.52	.30	A	12	32	.45	.15	O	
13	.45	.20	A	16	33	.39	.25	O	23
14	.45	.20	A	19	34	.31	.10	O	
15	.61	.30	A	2	35	.39	.20	A	24
16	.52	.30	A	13	36	-.31	-.10	R	
17	.52	.25	A	14	37	.42	.15	O	
18	.55	.35	A	9	38	.35	.20	O**	
19	.39	.05	O		39	.31	.10	O	
20	.48	.25	O**		40	-.25	-.05	R	

A = Accepted; O = Omitted; R = Rejected

* These items were omitted simply because to have harder items in that subtest.

** These items were omitted simply because to have the items of varied type.

Tables 3 and 4 show these difficulty (facility) and discrimination indices of the items selected respectively.

TABLE 3

DIFFICULTY (FACILITY) INDICES OF THE SELECTED ITEMS

Name of the subtest	.26-.30	.31-.35	.36-.40	.41-.45	.46-.50	.51-.55	.56-.60	.61-.65	.66-.70	.71-.75	Above .75
Vocabulary	-	-	1	-	3	4	4	11	2	-	-
	-	(1)	-		(1)	(4)	(2)	(4)	(6)	(3)	(4)
Sentence Completion	-	-	2	3	2	4	2	7	3	2	-
		(2)	(1)	(2)	(4)	-	(1)	(3)	(4)	(2)	(6)
Routine Completion	-	2	2	4	3	4	1	4	4	1	-
	(4)	(1)	(2)	(1)	(1)	(3)	(3)	(1)	(1)	(1)	(7)
Mathematical Reasoning	-	1	3	5	2	10	2	2	-	-	-
	(2)	(2)	(1)	(5)	(1)	(3)	(6)	(2)	(2)	(1)	

NOTE: The number in parentheses indicates the number of items as per facility index calculated by formula.

TABLE 4

DISCRIMINATIVE INDICES OF THE SELECTED ITEMS

Name of the subtest		.20 and below	.21-.25	.26-.30	.31-35	.36-.40	.41-.45	.46-.50	.51-55	.56-.60
Vocabulory	(	1	5	7	5	5	2	-	-	-
	(	-	-	-	(7)	(5)	(4)	(7)	(2)	-
Sentence Completion	(	6	6	2	8	2	1	-	-	-
	(	-	-	(7)	(7)	(4)	(6)	-	(1)	-
Routine Computation	(	9	9	5	1	1	-	-	-	-
	(	(1)	(6)	(8)	(3)	(5)	(1)	-	(1)	-
Mathematical Reasoning	(	8	8	6	1	2	-	-	-	-
	(	-	(2)	(3)	(9)	(3)	(5)	(1)	(1)	(1)

NOTE: The number in parentheses indicates the number of items as per discrimination index calculated by formula.

It can be observed from Tables 3 and 4 that facility indices calculated by formula have wider spread than those found by the chart for the same items. So far as discrimination indices are concerned, there is a visual shift towards higher values in calculated indices. As both the approaches were totally different, some type of discrepancy was expected.

Distractor Analysis :

After selecting the items on the bases of their difficulty and discrimination indices, the question of discarding one distractor for the each item selected was taken up. It has been observed that three - alternative - test makes up a more reliable test than either 2,4 or 5 alternative-test. As quoted by A. Edwin Harper, Jr. in his evaluation report of the research project proposal, "Research in the Chemistry department of Loyola College, Madras, showed that their 3-alternative achievement tests (for B.Sc. and M.Sc.) were more efficient than their 4-alternative and 5-alternative tests". Again, as all the four subtests consisting of 25 items each were to be completed within the time-limit of two consecutive periods of a class-room, it was essential to save as much time as possible without scarificing reliability of a subtest. It is understandable that in a given amount of time, a much larger of 3-alternative items than those of 4 or 5-alternatives can be attempted. As a corollary, it can be said that a fixed number (25, here) of 3-alternative items than those of 4 or 5-alternatives can be attempted in a less time. It was,

therefore, decided to have a 3-alternative items in each subtest. To discard the least attractive distractor, the distractor count of all the selected items was done.

Fixation of Time-limit:

Before the final version was to be administered for standardisation, it was essential to fix the time-limit of all the four subtests separately. It was after the starting of a new academic year (1981-82) that this task was to be carried out. So the pupils of grade VIII were to be administered the final printed version of the PSAT. Two classes of an average-type local school whose principal had taken special pains to complete the remained bit of course in Mathematics of VII, were selected. The PSAT was administered by the Principal Investigator himself so that all the research fellows could have the demonstration. The research fellows assisted in noting down the number of pupils who finished each subtest on a previously prepared time-sheet - which had columns for each 30 seconds beginning from a three-minute mark to 20 minutes. When about ninety percent of the group had finished one particular subtest, the rest were asked to 'stop'. Then the whole class was directed to the specific instructions of the next subtest. This process was repeated till the end of the fourth subtest.

As Stanley (1965, p. 194) states, "For the final version of general achievement tests, the time allowance should be such that at least 90 percent of students have time to consider all items in a timed section of the test - that is, can attempt

virtually all items within their power". In the PSAT, the above procedure was adopted. As all the subtests are power tests, they are, "work-limit tests" as against the"time-limit tests" or the "speed tests". Besides, the fact that the PSAT is to be used for VIIth graders of all schools in the Gujarat State and not for the urban schools of cities only, was also taken into account and hence, liberal work-limits were fixed up. "It is better to err in the direction of allotting too much time than to deprive some of the slower pupils from demonstrating their maximum levels of achievements". (Gronlund, 1976, p. 255).

The average time taken by two classes as well as the actual time-limit fixed for each subtest has been presented in Table 5.

TABLE 5

FIXATION OF TIME-LIMIT FOR FOUR SUBTESTS

Subtest	Actual average time taken by the two classes	Time-limit fixed for the final run
Vocabulary	8 minutes 30 seconds	9 minutes
Routine Computation	18 minutes 20 seconds	19 minutes
Sentence Completion	8 minutes 35 seconds	9 minutes
Mathematical Reasoning	17 minutes 40 seconds	18 minutes
	Total :	55 minutes

It was also observed that it took about 8 minutes for imparting general instructions and about 8 to 9 minutes for specific instructions of all the four subjects. Thus the full administration of the whole PSAT would require 55 minutes + 17 minutes = 72 minutes. Thus it would be quite feasible to administer the PSAT in two consecutive periods.

THE FINAL RUN

Preparation :

In each subtest, the twentyfive items selected were rearranged according to their difficulty values found out by item-analysis chart, in ascending order. The general instructions as a whole and specific instructions with two illustrations in the first subtest and one practice test in each subtest were finalised by necessary minor modifications so as to make them clear and adequately detailed as most of the pupils of grade VII would be having a novel experience of the testing procedure. Time-limits fixed for each subtest were inserted at the appropriate places which were kept blank during printing work. Separate answersheets were also printed. The copies of the test booklet and the answersheet are attached as Appendices B and C. All the research fellows administered the PSAT. to one class each under the supervision of the Principal Investigator and it was followed up by discussion. This experience created full confidence in them to administer the PSAT single-handed with some help of

a local school teacher who would work as a proctor.

The Selection of the Sample for the Final Run :

As mentioned earlier, because of the disturbances all over Gujarat, the final run could not be held in March 1981 on seventh graders as per schedule; it had to be carried out in July-August 1981 on the pupils of grade VIII who were mass-promoted from grade VII. For the selection of the sample, the state of Gujarat was divided into five regions : (a) North (b) South (c) East (d) West and (e) Central and ten districts out of total 18 districts were selected to have representative sample of the whole Gujarat state. From each district, the urban sample was selected from the district head-quarter with only one exception; the collectorate office in Kheda district is Kheda, a small town having 18,926 population and hence, Nadiad, the biggest urbanised town in the district with a population of 1,42,269 according to census data of 1981, was selected. The semi-urban sample was selected from taluka headquarters and the rural sample from villages having population less than five thousand of agricultural bias. Thus the total sample was stratified into three categories - urban, semi-urban and rural - in all the five regions.

Fifty-two classes of grade VIII from various schools were selected by cluster-sampling method from 44 different places spread over the whole State of Gujarat. Walker and Lev(1965, p. 175) define cluster-sampling as ".....the population is divided into many relatively small groups or clusters of individuals and the sample consists of a number of these clusters chosen at random." The map of Gujarat State presented in Figure 1 shows the location of forty-four places picturesquely. The numbers 1 to 44 stand for the places, the names of which have been mentioned in Appendix D.

From each school, only one class of grade VIII, [there the sampling units are themselves groups or clusters of natural units" (Walker and Lev, 1965, p. 173)] was administered the PSAT in two consecutive periods, preferably in the third and fourth periods. The list of the regionwise as well as the districtwise names of the schools where the final run was carried out has been presented in Appendix D.

But the areawise and the sexwise selection of subjects in each district has been shown in Table 6.~~below~~ (pp. 26-27)

It can be read from Table 6 that the range of number of schools selected from the districts is from four to seven. At least one urban school, two semi-urban schools and one rural school, the total being four, have been selected from each district. The total number of subjects selected from different districts varies from 151 (Kheda) to 265 (Ahmedabad). The total number of boys and girls whose answersheets were scored were

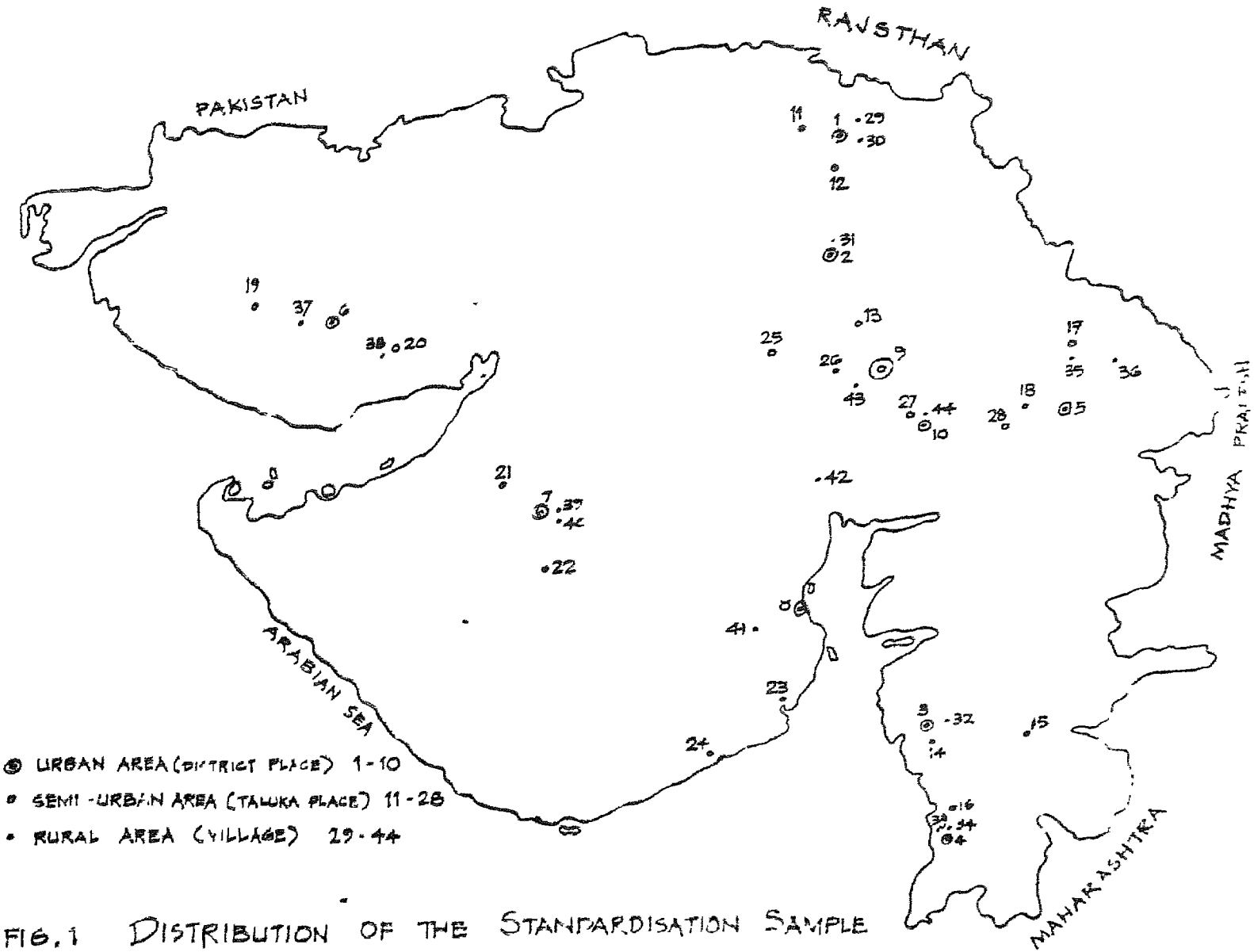

FIG. 1 DISTRIBUTION OF THE STANDARDISATION SAMPLE OVER THE STATE OF GUJARAT

TABLE 6

DISTRICTWISE, AREAWISE AND SEXWISE SELECTION OF THE SAMPLE FOR THE FINAL RUN

District	Area	No. of schools	Boys	Girls	Total	Cases discarded
Banaskantha	Urban	1	25	24	49	1
	Semi-urban	3	65	46	111	2
	Rural	2	78	18	96	3
	Total	6	168	68	256	6
Mehsana	Urban	1	-	37	37	3
	Semi-urban	2	81	-	81	3
	Rural	1	20	15	35	1
	Total	4	101	52	153	7
Surat	Urban	1	40	-	40	2
	Semi-urban	3	86	37	123	1
	Rural	1	18	17	35	-
	Total	5	144	54	198	3
Valsad	Urban	1	32	17	49	-
	Semi-urban	2	51	40	91	7
	Rural	2	35	41	76	3
	Total	5	118	98	216	10
Panchmahals	Urban	1	22	7	29	8
	Semi-urban	3	61	61	122	11
	Rural	2	37	14	51	10
	Total	6	120	82	202	29

contd.....

District	Area	No. of schools	Boys	Girls	Total	Cases discarded
Kutch	Urban	2	38	36	74	11
	Semi-urban	3	56	34	90	6
	Rural	2	32	24	56	9
	Total	7	126	94	220	26
Rajkot	Urban	1	49	-	49	-
	Semi-urban	2	71	28	99	8
	Rural	2	64	10	74	7
	Total	5	184	38	222	15
Bhavnagar	Urban	1	39	13	52	3
	Semi-urban	2	58	48	106	5
	Rural	1	42	6	48	2
	Total	4	139	67	206	10
Ahmedabad	Urban	2	27	73	100	-
	Semi-urban	2	48	45	93	2
	Rural	2	57	15	72	-
	Total	6	132	133	265	2
Kheda	Urban	1	-	42	42	1
	Semi-urban	2	51	38	89	7
	Rural	1	17	3	20	3
	Total	4	68	83	151	11
Areawise Total :						
	Urban	12	272	249	521	29
	Semi-urban	24	628	377	1005	52
	Rural	16	400	163	563	38
	GRAND TOTAL :	52	1300	789	2089	119

1300 and 789 respectively, the total being 2089. It can be seen from the table that in all 119 cases (5.39 percents) were to be discarded as they either responded half-heartedly or left one or two subtests, unattempted.

Administration :

All the research fellows got full co-operation from different schools as all necessary arrangements were made prior to their visit to schools, by correspondence. An introductory letter (Appendix E) giving necessary information was sent to Principals of all the schools who were requested to give their full co-operation for this unique statewide research project financed by National Council of Educational Research and Training, New Delhi. The dates and timings were fixed in advance. There were, however, four cases where the research fellows had to change the school in the same location because of the local inevitable circumstances. The Principals of 52 schools selected, provided all the facilities/information needed-a spacious well-ventilated classroom for test administration, one teacher to act as a proctor, birthdates from the general register, the ratings of pupils by Gujarati and Mathematics teachers, maintenance of discipline in the class, etc. Most of the subjects in some of the semi-urban and rural areas had such a novel experience of taking objective type of tests for the first time and they, therefore, enjoyed the whole session of administration.

Scoring of Answersheets :

All the 2089 answersheets were scored by using specially designed punched scoring stencils which facilitated the scoring process of all the four subtests. Before scoring an answersheet, it was scrutinised for marking at more than one alternative of the same item. Such items were got cancelled by drawing two horizontal lines on the correct answer with red colour. The scored answersheets were, then, checked by a different scorer. Wherever there was any discrepancy between two scorers, the answersheet was rechecked. As mentioned earlier, no correction-for-guessing formula was applied in the final run also. The scoring was done subtestwise. Raw scores of the subtests I and III and those of the subtests II and IV were totalled to have V-score and Q-score respectively. The total of V-score and Q-score, that is, raw scores of all the four subtests, was designated as total score. All the three scores were entered into appropriate places provided on the answersheet itself.

The Distribution of Scores :

The scored answersheets were categorised sexwise into different agegroups for each school tested. All the pupils having 10 years and 6 months to 11 years 5 months and 29 days' age were grouped as 11+ age group. Similarly all the agegroups from 11 to 16 were formed. The pupils of the age 17 and above were grouped in 17+ age group. The schools were distributed into three categories : (i) urban, (ii) semi-urban and

(iii) rural areas. The frequency distributions of V-scores, Q-scores and total scores were prepared areawise for each age group for both the sexes separately.

Appendix F presents areawise frequency distributions of V, Q and total scores of the age groups 11 to 17+ for boys and girls separately, with their means and SDS.

Sex-differences in Mean Scores :

To check whether there was any significant differences between the areawise V, Q and the total mean scores of boys and girls of all the age groups together, the t-test was applied.

Table 7 presents these data. (p. 31)

It can be observed from the table that there is no sex difference between any means of boys and girls of the urban area for V, Q as well as total scores. It can, therefore, be concluded that there is no need to have separate sex norms for the urban area.

So far as the semi-urban and rural areas are concerned, there are highly significant sex-differences between means of boys and girls for Q-scores and total scores. But there is a different picture for V-scores. For all the three areas, there is no significant sex-different between means. It was, therefore, decided to have separate sex-norms for the semi-urban as well as rural areas for Q-scores and total scores. Whether to have separate sex-norms for V-scores for these two areas, the whole problem of significant differences was viewed at, by different approach.

TABLE 7

SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS OF BOYS AND GIRLS (AREAWISE)

(A) V - SCORES

Area	Sex	N	Mean	S.D.	C.R.	Remarks
Urban	Boys	272	31.87	9.03	0.075	NS
	Girls	249	32.93	9.16		
Semi-urban	Boys	628	28.58	9.15	0.604	NS
	Girls	377	28.54	8.34		
Rural	Boys	400	27.51	8.20	0.842	NS
	Girls	163	26.89	7.81		

(B) Q - SCORES

Urban	Boys	272	25.92	7.29	1.76	NS
	Girls	249	24.82	6.98		
Semi-urban	Boys	628	24.40	7.84	4.82	**
	Girls	377	22.10	7.01		
Rural	Boys	400	24.77	6.70	6.24	**
	Girls	163	20.95	6.55		

(C) TOTAL SCORES

Urban	Boys	272	57.85	14.56	0.177	NS
	Girls	249	57.62	15.08		
Semi-urban	Boys	628	52.96	15.60	2.85	**
	Girls	377	50.27	13.76		
Rural	Boys	400	52.15	13.69	3.54	**
	Girls	163	48.03	12.02		

NS : Not Significant :: ** Significant at .01 level

Areawise Differences in Mean Scores :

The t-test was applied to see whether there was any significant differences between the means of boys and girls separately for three difference areas. For each type of scores (V,Q and total), there were three areawise comparisons : between urban and semi-urban, between urban and rural and between semi-urban and rural. Thus, there were, in all, eighteen critical ratios found to test the significance.

Table 8 represents scorewise and sexwise such inter-area comparisons.

TABLE 8

SIGNIFICANCE OF DIFFERENCES BETWEEN MEANS OF DIFFERENT AREAS (SEXWISE)

(A) V - SCORES

Sex	Area	N	Mean	SD	C.R.	Remarks
Boys	(i) Urban	272	31.87	9.03	5.00	**
	Semi-urban	628	25.58	9.15		
	(ii) Urban	272	31.87	9.03	6.37	**
	Rural	400	27.51	8.20		
	(iii) Semi-urban	628	25.58	9.15	1.95	NS
	Rural	400	27.51	8.20		
Girls	(i) Urban	249	32.93	9.16	6.49	**
	Semi-urban	377	28.24	8.34		
	(ii) Urban	249	32.93	9.16	7.16	**
	Rural	163	26.89	7.81		
	(iii) Semi-urban	377	28.24	8.34	1.81	NS
	Rural	163	26.89	7.81		

(B) Q - SCORES

Boys	(i) Urban	272	25.92	7.29	2.81	**
	Semi-urban	628	24.40	7.84		
	(ii) Urban	272	25.92	7.29	2.08	*
	Rural	400	24.77	6.70		
	(iii) Semi-urban	628	24.40	7.84	0.81	NS
	Rural	400	24.77	6.70		

contd.....

Sex	Area	N	Mean	SD	C.R.	Remarks
Girls	(i) Urban	249	24.82	6.98	4.76	**
	Semi-urban	377	22.10	7.01		
	(ii) Urban	249	24.82	6.98	5.72	**
	Rural	163	20.95	6.55		
	(iii) Semi-urban	377	22.10	7.01	1.83	NS
	Rural	163	20.95	6.55		
		(C) TOTAL SCORES				
Boys	(i) Urban	272	57.85	14.56	4.53	**
	Semi-urban	628	52.96	15.60		
	(ii) Urban	272	57.85	14.56	5.10	**
	Rural	400	52.15	13.69		
	(iii) Semi-urban	628	52.96	15.60	0.88	NS
	Rural	400	52.15	13.69		
Girls	(i) Urban	249	57.62	15.08	6.18	**
	Semi-urban	377	50.27	13.76		
	(ii) Urban	249	57.62	15.08	7.15	**
	Rural	163	48.03	12.02		
	(iii) Semi-urban	377	50.27	13.76	1.90	NS
	Rural	163	48.03	12.02		

NS : Not Significant

* : Significant at .05 level

** : Significant at .01 level

It is crystal clear from the Table 8 that in all types of scores there are significant differences between means of urban and semi-urban areas as well as between those of urban and rural areas, for both the sexes. On the other side, in all types of scores, there are no significant differences between means of semi-urban and rural areas for both the sexes. It was, therefore, concluded that there should be separate norms for the urban area while there should be combined norms for semi-urban and rural areas.

Norms - Groups :

Taking the data presented in both the Tables 7 and 8 as a whole into consideration, it was finally decided to have the following norm groups.

Urban Area :

V Scores (boys and girls together)
Q Scores (boys and girls together)
Total Scores (boys and girls together)

Semi-urban and Rural Areas :

V Scores (boys and girls separately)
Q Scores (boys and girls separately)
Total Scores (boys and girls separately)

For V-scores, there could have been combined sex norms for semi-urban and rural areas together. If there were significant sex differences for V scores for these two areas,

it would have been obligatory to have separate sex norms and there could not be combined sex norms. But the converse is not true. Inspite of having no significant sex differences between means for semi-urban and rural areas for V scores (Table 7), it was decided to have separate sex norms for these two areas, combined, thus evolving a congruous picture of norm-groups.

ESTABLISHMENT OF NORMS

In the absence of additional interpretive data, a raw score, though a fundamental piece of information on any psychological test, is meaningless. In the process of standardising the test, it is administered to a large, representative cross-section sample of the type of subjects for whom it is designed. This group, known as the standardisation sample, is used in establishing the norms. The norms are thus empirically established by determining what a respresentative group of persons - the standardisation sample-actually does on the test.

Selection of Age-groups :

While preparing age groupwise (11 to 17+) frequency distributions for all types of scores, it was noted that the extreme age groups on both sides, namely, 11 and 17+ had atypical means when compared to those of other age groups. Agegroup 11+ was having bit high mean value and agegroup 17+ having appreciably low mean value. This was, of course, quite natural as the former age group was an accelerated group while

the latter agegroup was a very subnormal group when the modal age for grade VIII, here 13+ (12 years 6 months to 13 years, 5 months and 29 days), was taken into consideration. It should be reminded here that the final run was carried out in the beginning of a new academic year, that is, in July-August 1981. To have a normal standardisation sample for establishing norms, it was thought worthwhile to delete the pupils of 11+ agegroup on one side and pupils of both 16 and 17+ age groups on the other side. By doing so, one can have a better standardisation sample for establishing norms which would, then, be not vitiated.

The Standardisation Sample :

In Appendix F, the number of boys and girls in each agegroup for all the three areas have been presented separately. In Table 9, the total number of pupils who were administered the final run, the areawise and the sexwise number of cases discarded and the actual number of pupils taken as a standardisation sample have been presented. (p 38)

It can be read from Table 9 that 241 subjects belonging to the agegroups 11, 16 and 17+ were discarded from the total number of 2,089 subjects who were administered all the four subtests in the final run. So the normative sample consisted of 1,848 subjects who were categorised into the following three groups for establishing sexwise and areawise norms as was decided earlier :

TABLE 9

SELECTION OF THE STANDARDISATION SAMPLE

(Areawise and Sexwise)

Area	Sex	Number of cases in the final run	Number of cases deleted (11+, 16+, 17+)	Actual Number of Subjects for the standardisation sample
Urban	Boys	272	17	255
	Girls	249	4	245
Semi-urban	Boys	628	75	553
	Girls	377	36	341
Rural	Boys	400	85	315
	Girls	163	24	139
	Total	2,089	241	1,848

(i) Urban group (boys and girls together) N = 500

(ii) Semi-urban and Rural groups (Boys only) N = 868

(iii) Semi-urban and Rural groups (Girls only) N = 480

Frequency Distributions of V, Q and Total Scores of the Standardisation Sample :

The raw scores of subtests 1 + 3, subtests 2+4 and subtests 1 + 2 + 3 + 4 were recognised as Verbal (V), Quantitative (Q) and total (Total) Scores respectively. (For total Scores, 'T' was not used to avoid the misunderstanding as it is being used for T Scores - normalised standard scores - first devised by McCall.)

Table 10 presents all the three frequency distributions of these scores with their respective means and SDS, based on the total standardisation sample.(p.40)

The performance on the language tests (1+3) has been better than that of the mathematics tests (2+4). Or it can be said that mathematics tests may be more difficult than the language tests. Again, all the three frequency distributions are positively skewed. As all the subtests were administered to the same subjects and the Q Scores had more skewness than V scores, it can be concluded that mathematics tests were found harder to the standardisation sample.

All the three frequency distributions were smoothed once and histograms were plotted using these smoothed frequencies. Figures 2, 3 and 4 show the distributions of V, Q and total scores respectively of the standardisation sample of 1,848 subjects. The frequency polygons are superimposed on these histograms.

TABLE 10

FREQUENCY DISTRIBUTIONS OF V, Q AND TOTAL SCORES OF THE STANDARDISATION SAMPLE

Class Interval	Frequencies V Scores	Frequencies Q Scores	Class Interval	Total Scores
46 - 50	53	3	91 - 100	2
41 - 45	185	34	81 - 90	64
36 - 40	266	99	71 - 80	197
31 - 35	349	232	61 - 70	333
26 - 30	344	354	51 - 60	430
21 - 25	322	499	41 - 50	428
16 - 20	234	435	31 - 40	323
11 - 15	79	169	21 - 30	62
6 - 10	15	23	11 - 20	9
1 - 5	1	-	1 - 10	-
N	1848	1848	N	1848
Mean	29.91	24.15	Mean	53.5
Median	29.47	23.75	Median	52.87
SD	8.92	7.37	SD	14.85
Sk	0.148	0.163	Sk	0.127

FIG. 2 DISTRIBUTION OF V-SCORES OF THE STANDARDISATION SAMPLE

FIG. 3 DISTRIBUTION OF Q-SCORES ON THE STANDARDISATION SAMPLE

FIG. 4 DISTRIBUTION OF TOTAL SCORES OF THE STANDARDISATION SAMPLE

The Selection of Norms :

Since the PSAT has been developed for use in schools by the school teacher, the school administrator and the guidance personnel, it was considered necessary that such a converted score be used which may be simple to understand and easy to use. Percentile norms are more frequently used for such types of tests as they satisfy both the conditions.

The investigator, however, has preferred to provide Stanine norms only. These broad numbers (1 to 9) are quite adequate for making any valid distinctions and, conversely, discourage users for assuming that small differences (as in percentile norms) in scores are "real". This tool has been developed with one major objective of screening the pupils at the entrance in grade VIII. It is, then, beyond doubt to have preference for Stanines to percentile norms.

The other reasons for preferring stanines are :

1 Stanine grades are the quickest and easiest to prepare (most tests can be scaled in less than half an hour). This is a great advantage for the school-teacher.

2 They are very easy to understand and interpret.

3 The Stanine grades represent equal units of ability and so the Stanines represent equal differences throughout the scale. For example, the difference between Stanines of 8 and 9 is the same as the difference between 5 and 6.

4 The Stanine grades are directly comparable from test to test when calculated on the same group of students.

5 Stanine grades are more stable (reliable) than almost any other system of scores.

6 The Stanine grades are sufficiently precise for almost any common use, as well as for all ordinary statistical manipulations. (Harper, 1959, pp. 107-108).

Norm Groups :

As already discussed earlier, three separate groups were arranged to have separate norms for each. The first group consisted of boys and girls together residing in the urban area. The second group was of boys only staying in the semi-urban and rural areas and the last, the third group covered the girls of the semi-urban and rural areas.

Statistical data about these three groups have been presented below in Table 11.

TABLE 11

STATISTICAL DATA OF NORM GROUPS

Group I : Urban (boys and girls) N = 500

Score	Mean	Median	SD	Skewness
V	32.66	33.68	9.25	- .33
Q	25.34	25.45	7.21	- .05
Total	57.86	59.07	17.41	- .25

Group II : Semi-urban and Rural (boys) N = 868

V	28.54	28.26	8.80	.10
Q	24.65	25.50	7.45	- .34
Total	53.02	51.76	15.04	.25

Group III : Semi-urban and Rural (girls) N = 480

V	28.95	27.97	8.27	.10
Q	21.90	21.37	6.91	.23
Total	50.08	49.39	13.20	.16

It is very intersting to note that all the three scores for the urban area are negatively skewed while those of the girls residing in semi-urban and rural areas are all positively skewed. V scores and total scores of boys of semi-urban and rural areas are alsc positively skewod but Q scores of the same group is negatively skewed.

STANINE NORMS :

To derive Stanine norms of the three groups for three different scores cumulative percentage frequencies were smoothed once and these smoothed percentage frequencies were used to plot cumulative percentage curves known as smoothed ogives. Scores in each Stanine interval were read from these ogives.

Figures 5, 6 and 7 present smoothed ogives of the norms group I consisting of boys and girls of the urban area for V, Q and total scores respectively. Figures 8, 9 and 10 are smoothed ogives of the boys of semi-urban and rural areas, that is, of the norm group II and lastly, figures 11, 12 and 13 show smoothed ogives of the norm group III - the girls belonging to semi-urban and rural areas - for V, Q and total scores respectively.

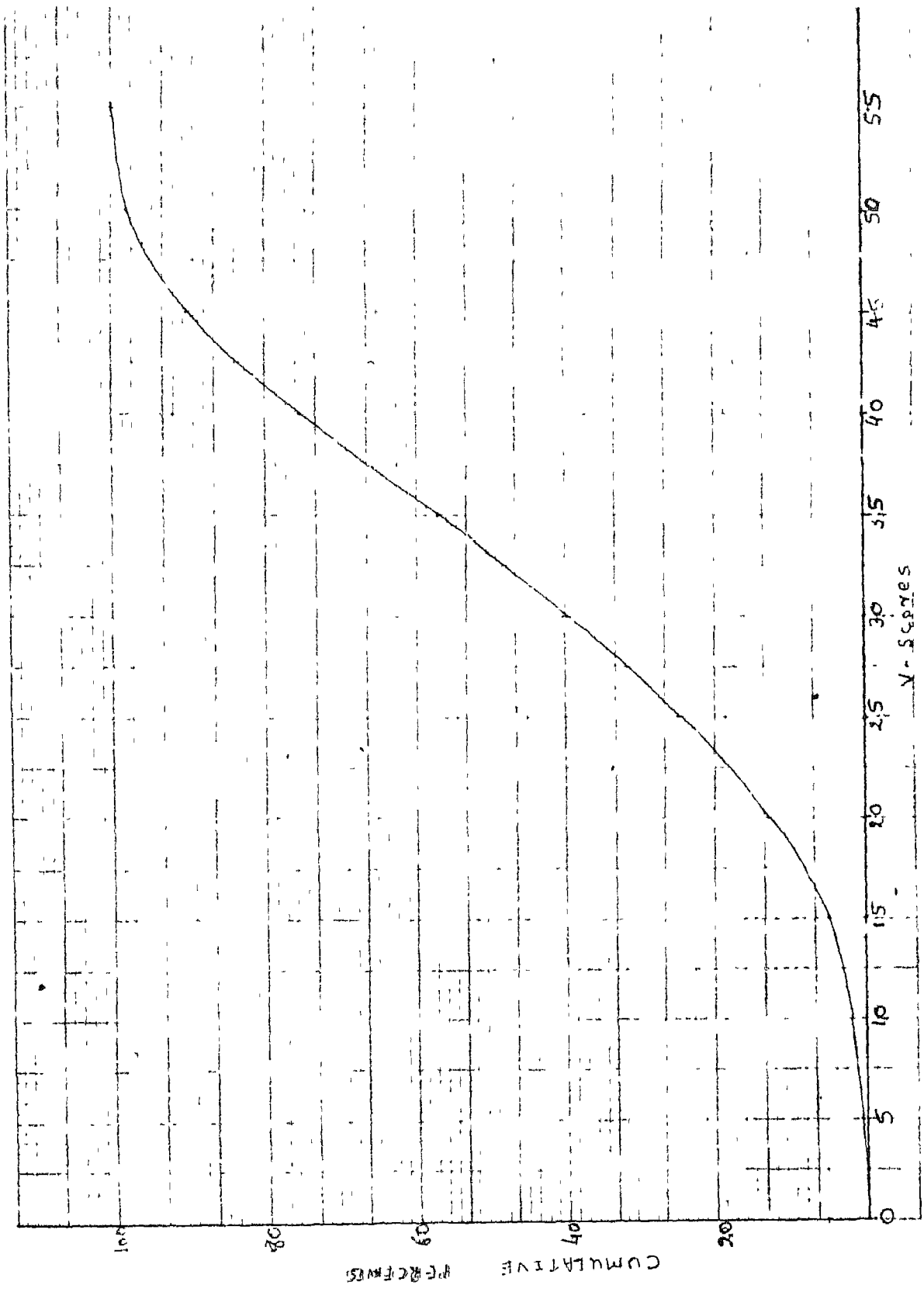

FIG.5 SMOOTHED OGIVE OF V-SCORES OF THE URBAN SAMPLE (B+G)

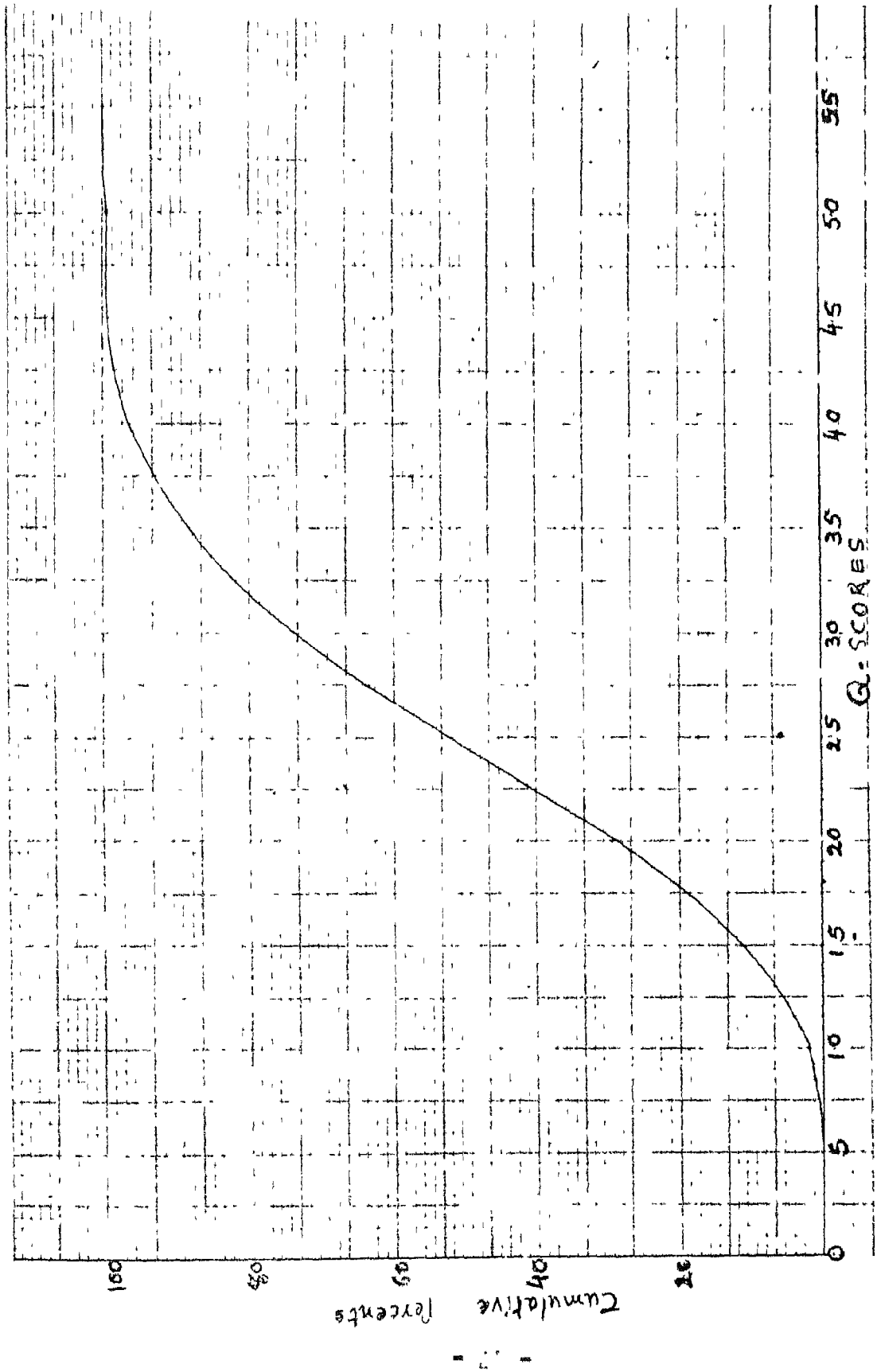

FIG. 6 SMOOTHED OGIVE OF Q-SCORES OF THE URBAN SAMPLE (B+G)

46

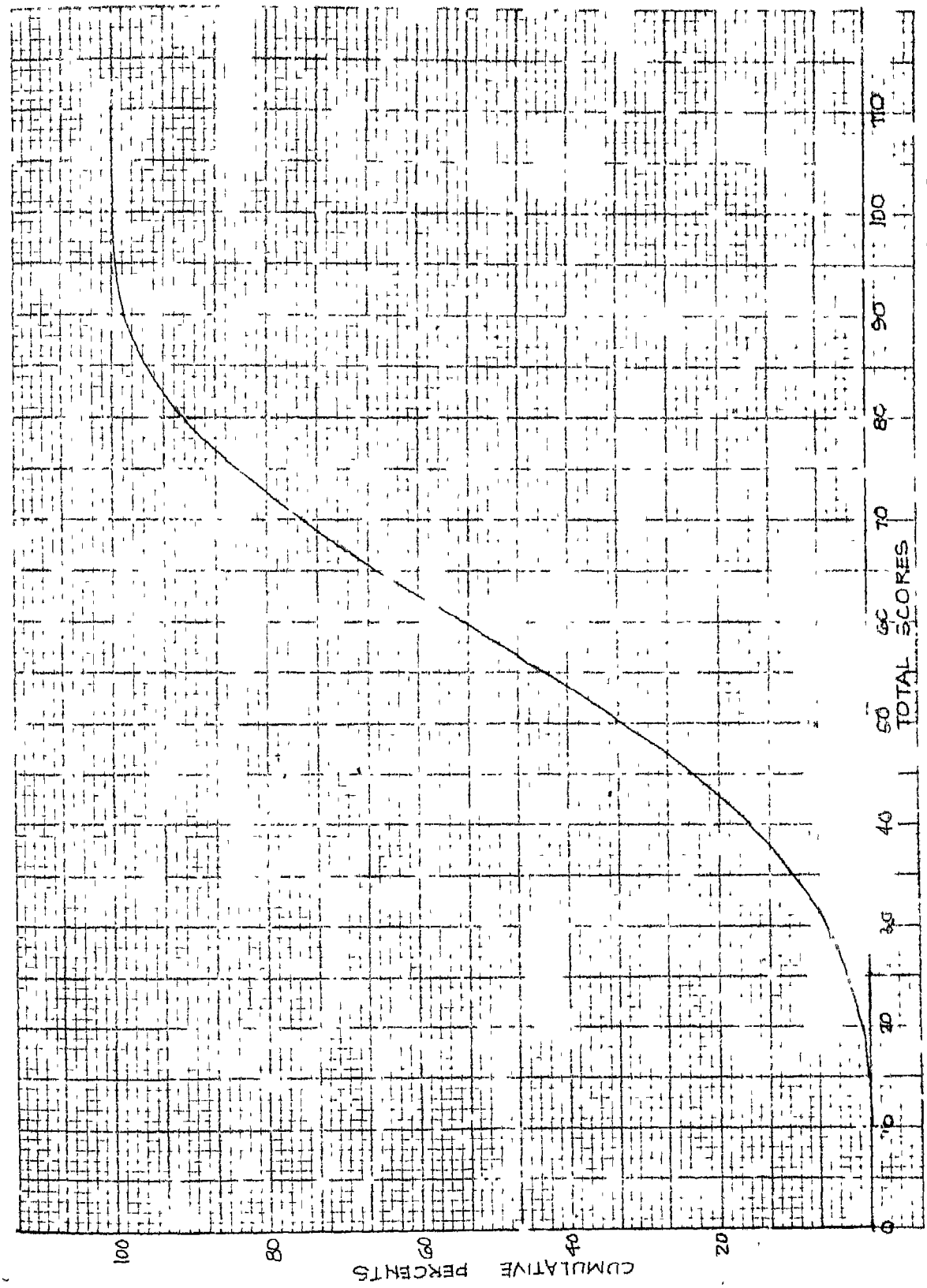

FIG. 7 SMOOTHED OGIVE OF TOTAL SCORES OF THE URBAN SAMPLE (6+5)

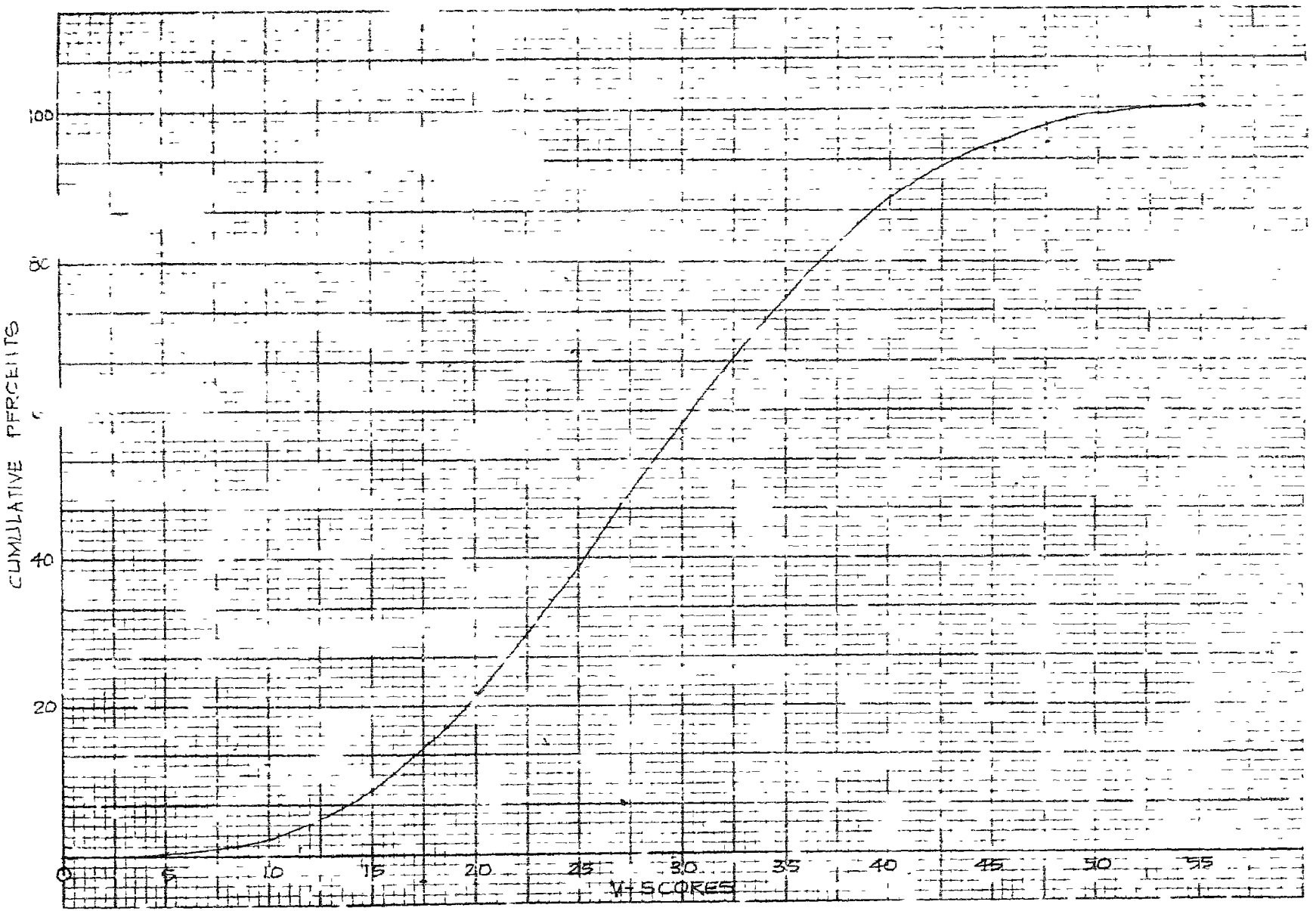

FIG. 8 SMOOTHED OGIVE OF V-SCORES OF THE SEMI-URBAN AND THE RURAL SAMPLE OF BOYS

FIG.9 SMOOTHED OGIVE OF Q-SCORES OF THE SEMI URBAN AND THE RURAL SAMPLES OF BCG

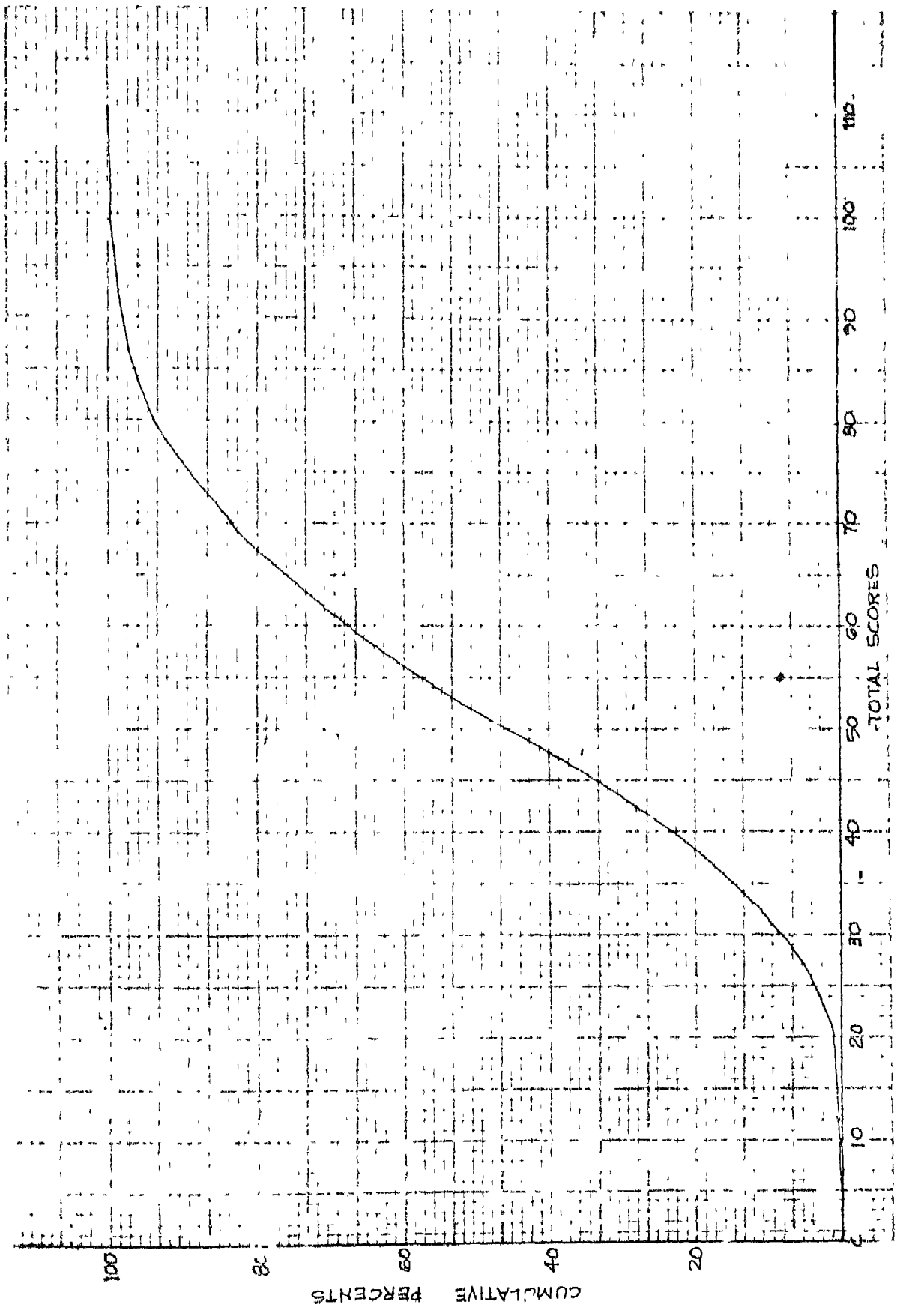

Fig. 10 SMOOTHED OGIVE OF TOTAL SCORES OF THE SEMI-URBAN AND THE RURAL SAMPLE OF BOYS

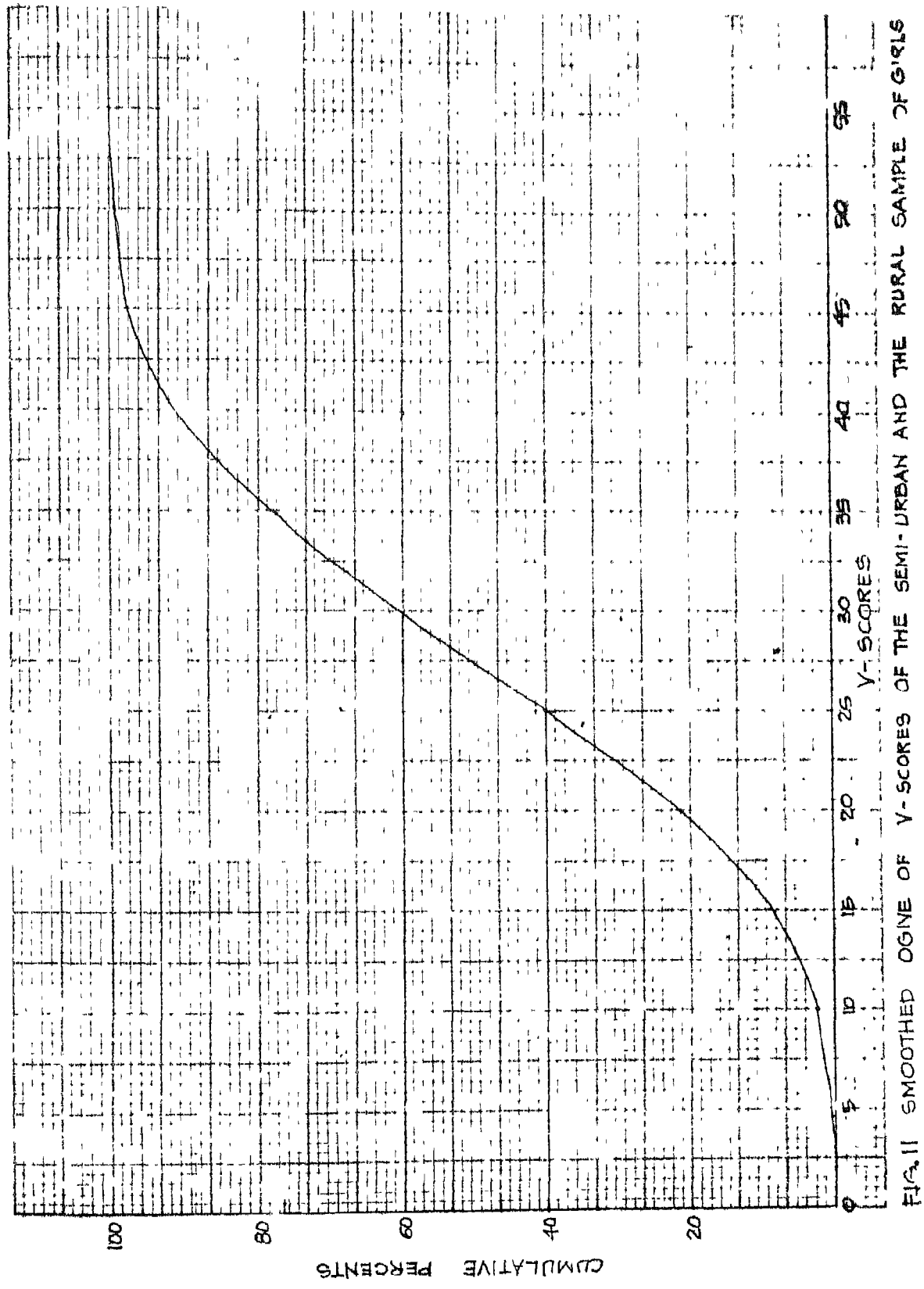

FIG. II SMOOTHED OGIVE OF V-SCORES OF THE SEMI-URBAN AND THE RURAL SAMPLE OF GIRLS

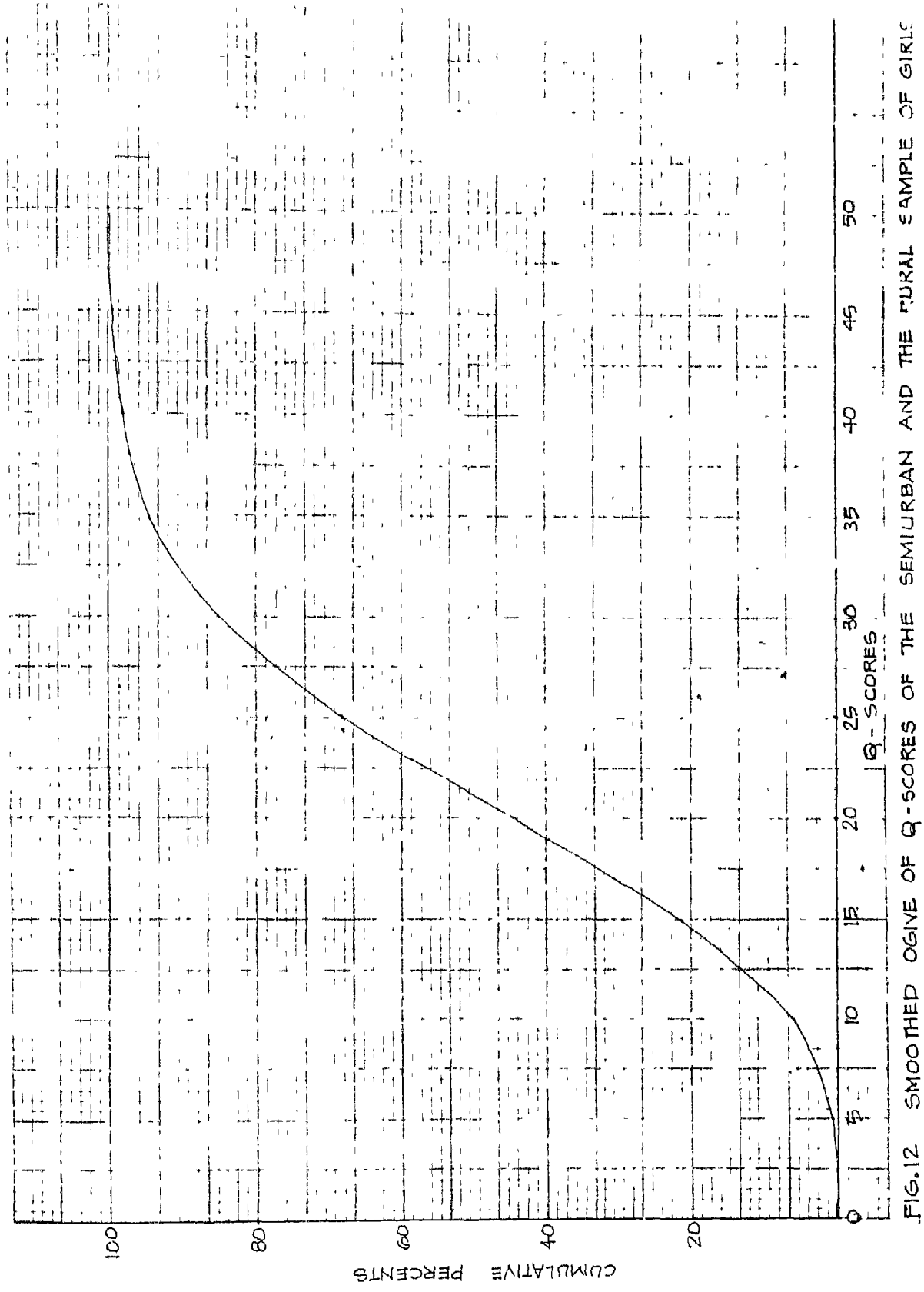

FIG.12 SMOOTHED OGIVE OF Q-SCORES OF THE SEMIURBAN AND THE RURAL SAMPLE OF GIRLS

54

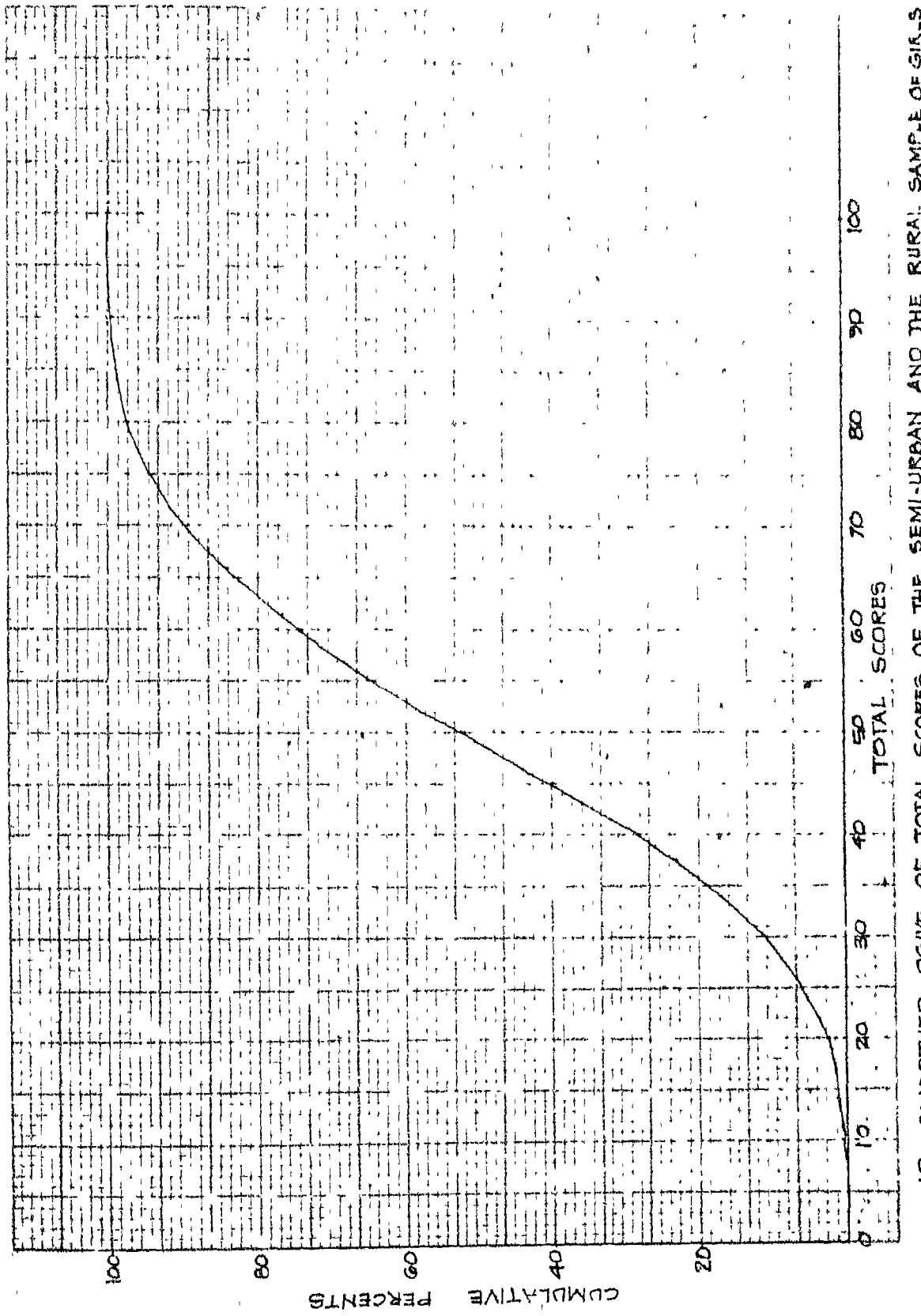

FIG. 13 SMOOTHED OGIVE OF TOTAL SCORES OF THE SEMI-URBAN AND THE RURAL SAMPLE OF GIRLS

55

Table 12 below presents conversion table for three different norm groups.

TABLE 12

STANINE NORMS

(A) Group I : Urban (boys and girls)

Stanine	RAW SCORES		
	V Score	Q Score	Total Score
9	49-50	41 and more	86 and more
8	46-48	37-40	80-85
7	42-45	32-36	72-79
6	37-41	28-31	64-71
5	31-36	24-27	55-63
4	26-30	20-23	46-54
3	20-25	16-19	37-45
2	15-19	13-15	28-36
1	0-14	0-12	0-27

(B) Group II : Semi-urban and Rural (boys only)

Stanine	RAW SCORES		
	V Score	Q Score	Total Score
9	47 and more	41 and more	85 and more
8	42-46	37-40	76-84
7	37-41	32-36	67-75
6	32-36	27-31	57-66
5	27-31	23-26	49-56
4	22-26	19-22	41-48
3	18-21	16-18	34-40
2	13-17	12-15	27-33
1	0- 12	0 -11	0 -26

(C) Group III : Semi-urban and Rural (girls only)

Stanine	RAW SCORES		
	V Score	Q Score	Total Score
9	45 and more	38 and more	78 and more
8	40-44	33-37	70-77
7	35-39	29-32	64-69
6	31-34	25-28	54-63
5	26-30	20-24	46-53
4	22-25	17-19	39-45
3	18-21	13-16	31-38
2	13-17	10-12	24-30
1	0 -12	0 - 9	0 -23

SUBTEST INTERCORRELATIONS

The objective of the PSAT is to measure two abilities - Verbal and Quantitative - which are believed to be basic to academic success. It was assumed that these two abilities, measured by the PSAT, are sufficiently different to warrant their inclusion in the test. To verify this assumption, intertest - correlations were computed by product-moment formula. These were based on a sample of 200 subjects randomly drawn from all the fiftytwo schools where the PSAT was administered, in proportion to the size of the school-sample. Table 13 presents these intercorrelations.

TABLE 13

INTERCORRELATIONS AMONG SUBTESTS

(N = 200)

Subtest	Mean	SD	Subtest			
			I	II	III	IV
I (Vocabulary)	14.49	4.72	-	.52	.69	.44
II (Arithmetic Computation)	12.31	4.05	.52	-	.51	.38
III (Sentence Completion)	14.22	4.67	.69	.51	-	.54
IV (Arithmetic Problems)	11.56	3.88	.44	.58	.54	-

Note : All rs significant at .01 level.

It can be observed that all the correlations are positive and substantial indicating thereby that these subtests do probably have some common factor also.

It would be very interesting to compare these coefficients of correlation with those of Academic Aptitude Test (AAT) developed and standardised by S.K.V. Liddle as well as with those of the Co-operative School and College Ability Tests (SCAT) standardised by Educational Testing Service. The intercorrelations among the subtests of AAT ranged from .26 to .63 while those among the subtests of SCAT ranged from .40 to .75 as quoted by S.K.V. Liddle in his thesis (Liddle, p. 92). In the present investigation, the range is from 0.44 to .69 which is very similar to the SCAT at the lower end while at the upper end, it is rather exactly at the middle value (.69) between those of AAT (.63) and SCAT (.75).

As a further study, the present investigator will like to carry out factor analysis by Hotelling method on the data collected from the randomly selected sample of 200 pupils. It will, perhaps, give the true picture of the factors measured by the PSAT.

Howsoever, the tables of intercorrelations among the subtests of AAT and SCAT are presented in Appendix G to have a comparative picture of these intercorrelations.

ESTIMATING THE RELIABILITY AND THE VALIDITY OF THE PSAT

To answer the question whether the PSAT is a good measuring device, it is necessary to examine how far the measuring instrument is free from four kinds of errors. These are : interpretive error, personal error, variable error and constant error. The problem of interpretive error is taken care of through a process called standardisation. The degree of objectivity of the PSAT reflects the extent to which personal error has been avoided. Reliability of the PSAT is an indication of the relative freedom from variable error and validity of the PSAT is an indication that the test measures what it purports to measure and, therefore, is not influenced by constant error.

The preceding pages dealing with the standardisation process indicates that this PSAT is, to a large extent, free from interpretive errors. As all the items in PSAT are multiple-choice items having one and only one correct answer for each item, the scoring standards of PSAT are fully objective and they, therefore, avoid all personal errors. The last two criteria of evaluating the PSAT - reliability and validity - are now discussed thus showing how far this test is relatively free from variable and constant errors.

Reliability :

Test-Retest reliability : The simplest way to find the reliability of a test is by means of a retest, or repetition of the identical test on a second occasion. The reliability coefficient which is also known as the coefficient of stability

is nothing but the correlation between the scores obtained by the same subjects on the two administrations of the test. The PSAT was readministered in three schools at an interval of six months.

Reliability coefficients computed by product-moment formula on the sample of 114 pupils were : 0.83 (V Scores), 0.78 (Q Scores) and 0.94 (Total scores).

Reliability by odd-even method : The sample of 200 pupils drawn at random for finding interest-correlations was used. As all the subtests consist of twentyfive items, the last item in each subtest was not taken into consideration. Spearman-Brown formula was applied to find out the reliability of the full subtests. Coefficients of reliability were as follows :

0.88 (V Scores)
0.76 (Q Scores)
0.89 (Total Scores)

Method of rational-equivalence : Kuder-Richardson formula 21 was used on the data collected from the total standardisation sample of 1848 pupils (Table 10). The estimated reliability coefficients were 0.87 (V Scores), 0.79 (Q Scores) and 0.90 (total scores).

Standard Error of Measurement : The standard error of measurement is a better way of expressing the reliability of the test and tells the test-user how adequately an obtained score represents its true score. One of the greatest advantages of

determining and reporting the S.E. of measurement is that the concept of "margin of error" or range within which a test is accurate can be easily grasped by the test-user.

The S.E.Ms for V scores, Q scores and total scores were calculated by the formula : $S.E.\ (Meas.) = SD\sqrt{1 - r_{11}}$ (SD values used here were taken from Table 10 - the data on the Standardisation Sample).

The range of S.E.Ms for different reliability coefficients is given below :

V Score : 3.09 to 3.68 (3 or 4 points)

Q Score : 3.38 to 3.61 (3 or 4 points)

Total Score : 3.64 to 4.93 (4 or 5 points)

The complete data about the reliability estimation of the PSAT are presented in Table 14.

TABLE 14

ESTIMATING RELIABILITY OF THE PSAT

Method	N	Scores		Total Score
		V	Q	
		← r_{tt} →		
Test-retest (6 months' interval)	114	0.83	0.78	0.94
Split-half	200	0.88	0.76	0.89
K-R formula 21	1848	0.87	0.79	0.90
Standard error of measurement	-	3 to 4 points	3 to 4 points	4 to 5 points

Validity :

The validity of a test, or of any measuring instrument, depends upon the fidelity with which it measures what it purports to measure. A test that helps in making one decision may have no value at all for another. This means that validity is a relative term and one cannot ask the general question, "Is this a valid test ?" A test is valid for a particular purpose or in a particular situation - it is not generally valid.

The main objective of the present investigation was to estimate the real capacity of the seventh graders by using the PSAT. At the time of proposing this research (that is, in 1978-79), a public examination for the seventh graders, on the line of Secondary School Certificate Examination Board of Gujarat State to some extent, was held and it was, therefore, proposed to validate the results of the PSAT with those of the public examination. But for one or the other reason, the very next year the public examination was discontinued and annual examinations were taken by the schools themselves!!! In March-April 1981, there was, again, mass-promotion in the state of Gujarat and the present investigator had to carry out the final run, as mentioned earlier, on the pupils of VIII grade and had to ask for extension of six months, to complete this research project. Under these unforeseeable circumstances, it was not possible for the present investigator to carry out the study of estimating predictive validity under the scheduled time-limit. He very much

wishes to validate the results obtained on pupils of grade VIII with the results that will be obtained in class X Board Examination of the year 1984 and develop regression equations as well as confidence bands of board examination marks to be predicted from the PSAT Stanines. He does understand that without such predictive validity, the test will not fulfill the purpose set out for it.

The present investigator, however, validated the V scores, Q scores and total scores obtained on the PSAT with the percentages of marks obtained in Gujarati, Mathematics and academic subjects only, respectively. For this purpose, three schools each from urban, semi-urban and rural areas were selected. The validity coefficients obtained are presented schoolwise and scorewise in Table 15.

TABLE 15

THE PRODUCT - MOMENT VALIDITY COEFFICIENTS+

School	N	V Score vs Gujarati marks	Q Score vs Maths. marks	Total scores vs total marks in academic subjects only
Urban Area :				
A	49	.55	.75	.61
B	38	.54	.65	.51
C	43	.54	.49	.69
Semi-urban Area :				
D	46	.32	.47	.42
E	48	.46	.61	.59
F	49	.29*	.39	.65
Rural Area :				
G	43	.67	.30*	.53
H	52	.75	.47	.62
I	33	.68	.71	.75
Range	-	.29 to .68	.30 to .75	.42 to .75

\+ All values are corrected by Peters and Van Voorhis constants

* Significant at .05 level; all other values are significant at .01 level.

Validation with other Psychological Tests : Before the final run was commenced, attention was concentrated upon the selection of various criteria and to the methods of collecting evidences against which the PSAT could be validated.

As already presented, the PSAT scores were validated against percentages of marks obtained in the annual examinations. It was also decided to validate this PSAT with several well-established tests on which norms were available for Gujarati population. Table 16 below shows the names of the tests used as validity criteria, total number of pupils to which they were applied and validity coefficients computed thereon by product-moment formula.

TABLE 16

VALIDITY COEFFICIENTS OF THE PSAT WITH OTHER PSYCHOLOGICAL TESTS

Sl. No.	Name of the test	N	Type of Score	Validity Coeff.
1	Trivedi & Patel's Reading Ability Test	73	V	0.76
2	Shah's Vocabulary Test	55	V	0.65
3	Desai's Language Ability Test	155	V	0.77
4	~~Shah's~~ Bhavsar's Numerical Ability Test	109	Q	0.59

Validation with Teachers' rating : In five different schools, the language and mathematics teachers were instructed to rate their pupils on a five point scale about their abilities in the respective subjects. The contingency coefficent (C) of language teachers' ratings and V scores was found to be 0.57 (N = 140) and that of mathematics teachers' ratings and Q score was .61 (N = 186). (In one school, the language

teacher of the class concerned was on leave and could not be contacted in person and hence, the difference in total number of subjects).

Differences between means of VI, VII and VIII grades on the PSAT : One new school (not included in different tryouts) from Ahmedabad city was selected and the pupils of VI, VII and VIII grades were administered the PSAT to see whether there were significant differences between means of VI and VII as well as VII and VIII. Table 17 presents the data obtained from these three grades.

TABLE 17

t TEST FOR DIFFERENT SCORES OF PUPILS OF VI, VII AND VIII GRADES

Group	N	M	S.D.	t	Level of significance
(A) Verbal Score					
VI	100	29.75	7.76	7.83	$<.01$
VII	91	37.89	6.63	3.23	$<.01$
VIII	90	40.78	5.33		
(B) Q Score					
VI	100	21.05	5.43	11.12	$<.01$
VII	91	30.97	6.75	3.21	$<.01$
VIII	90	34.22	6.86		
(C) Total Score					
VI	100	51.20	11.68	10.34	$<.01$
VII	91	69.02	12.08	2.17	$<.05$
VIII	90	72.62	10.13		

As per expectations, the differences between means of V score, Q score and total score of the sixth and seventh graders are highly significant beyond .01 level while the same between the seventh and eight graders are significant at .01 level in V score and Q score but at .05 level in total score. These critical ratios throw light upon the validity of the PSAT; means are significantly increasing gradewise.

The validating criteria used here ensure that the PSAT possesses a fairly high degree of validity. However, Mursell would permit no one to be complacent. "The ultimate validation of any test is to be found only in its wide and serviceable use." (Mursell, p. 45). The present PSAT, must, therefore, await the judgement of its patrons and a critical evaluation by the experts.

CONCLUSION

Following the pattern of the Co-operative School and College Ability Test (SCAT) of the Educational Testing Service, U.S.A., the Primary School Ability Test (PSAT) has been developed and standardised on the stratified cluster sample of 1848 pupils, drawn from fifty two schools of various regions of the state of Gujarat. Stanine norms are established for V score, Q score and total score. Reliability and validity of the PSAT have been estimated by using various methods. The PSAT yields a verbal, a quantitative and a total score.

It can be administered in two school periods. It has a separate answersheet which can be hand-scored by using punched scoring stencils very easily and ~~xxx~~ quickly. It is hoped that it will fulfill its prime purpose of estimating developed ability of a pupil at the end of VII grade in the state of Gujarat.

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A P P E N D I C E S

APPENDIX A

FACILITY AND DISCRIMINATION INDICES OF THE SELECTED ITEMS CALCULATED BY FORMUL.

New Serial Number	SUBTESTS 1		2		3		4	
	F.I	D.I	F.I	D.I	F.I	D.I	F.I	D.I
1	81.5	.37	85	.20	86	.26	75.5	.33
2	79.5	.35	79	.30	85	.26	68.5	.37
3	77	.36	80.5	.27	78.5	.31	66.5	.25
4	73.5	.31	79.5	.23	80	.32	65	.34
5	75.5	.33	77.5	.21	80.5	.37	61	.34
6	70.5	.41	76.5	.37	74	.42	57.5	.35
7	68.5	.43	75	.34	74	.28	57	.54
8	68.5	.37	77	.28	76.5	.35	60	.34
9	68.5	.49	69	.36	69.5	.31	56.5	.49
10	66.5	.51	62.5	.37	68.5	.29	57	.58
11	72	.34	56.5	.41	69.5	.43	55.5	.33
12	65.5	.47	56.5	.35	68	.44	52.5	.43
13	68.5	.49	56	.26	65	.30	51.5	.43
14	63	.48	49	.24	61	.44	53	.42
15	62.5	.33	53	.38	47.5	.31	49.5	.41
16	62	.50	50.5	.25	61.5	.27	44	.32
17	63.5	.33	50.5	.51	56.5	.39	44.5	.33
18	58	.46	45	.36	46.5	.41	42	.28
19	59.5	.51	36.5	.25	47.5	.31	42.5	.29
20	53.5	.47	35	.30	47	.42	42	.36
21	54	.36	39.5	.35	41	.30	36	.44
22	49	.38	29	.28	44.5	.51	31	.40
23	51	.44	28	.26	37.5	.39	30	.32
24	51.5	.43	27.5	.23	30.5	.35	31.5	.27
25	30.5	.35	28	.28	30.5	.39	26.5	.25

APPENDIX B

પ્રાથમિક શાળા સિદ્ધિ કસોટીઓ

રાષ્ટ્રીય શૈક્ષણિક સંશોધન અને તાલીમ પરિષદ,

ન્યુ દીલ્હીના

અનુદાનથી હાથ ધરેલો સંશોધન પ્રોજેક્ટ

: મુખ્ય સંશોધક :

ડા. જયંતીભાઈ એચ. શાહ

શિક્ષણશાસ્ત્રના રીડર

મનોવિજ્ઞાન, શિક્ષણશાસ્ત્ર અને તત્વજ્ઞાન ભવન

ગુજરાત યુનિવર્સિટી

અમદાવાદ-૩૮૦૦૦૯

સામાન્ય સૂચનાઓ

આ કસોટીઓ ચાર પેટાકસોટીઓમાં વહેંચાયેલી છે. તમારે એક પછી એક પેટાકસોટી ક્રમ પ્રમાણે લેવાની છે દરેક પેટાકસોટી પર પૂરેપુરું ધ્યાન કેન્દ્રિત કરો અને તેનો દરેક પ્રશ્ન કાળજીપૂર્વક વાંચી તેનો જવાબ શોધો. તમને કેટલાક પ્રશ્નો ખૂબ સહેલા લાગશે અને કેટલાક થોડા અઘરા પણ લાગશે.

આ કસોટીઓ લેવા માટે કેટલાક સામાન્ય નિયમો અહીં આપ્યા છે જે ધ્યાનમાં લેવાથી તમે સારી રીતે કામ કરી શકશો અને વધુ ગુણ મેળવી શકશો

: ક : કાળજીપૂર્વક કામ કરો પરંતુ કોઈપણ એક પ્રશ્ન ઉપર વધુ પડતો સમય ન ગાળશો. દરેક વિભાગમાં તમને જે પ્રશ્નોના જવાબો સારી રીતે આવડતા હોય અને જલદીથી જવાબ આપી શકાય તેમ હોય તે સૌ પ્રથમ કરી લો. પાછળથી, બાકી રહેલા પ્રશ્નો ઉપર વિચાર કરીને જવાબ શોધી શકો

: ખ : જો તમે સામાન્ય ઝડપથી કામ કરશો તો બધા પ્રશ્નો વાંચવા માટે તેમજ જવાબ આપવા માટે તમને પૂરતો સમય મળી જ રહેશે. જે પ્રશ્નો તમને ખૂબ અઘરા લાગે તે છોડી દઈ, પાછળથી તે પ્રશ્નો અંગે વિચારશો તો તમે સમયનો સારામાં સારો ઉપયોગ કર્યો ગણાશે આવી રીતે વચ્ચે કોઈ પ્રશ્ન છોડી દો તો તે વખતે ઉત્તરપત્રમાં જવાબ લખતી વખતે પ્રશ્નનો યોગ્ય ક્રમાંક ધ્યાનમાં લેવાનું ભૂલશો નહિ.

: ગ : તમને જે અલગ ઉત્તરપત્ર આપ્યું છે તેમાંજ તમારે જવાબો લખવાના છે. આ કસોટી પુસ્તિકામાં તમારે કશું જ લખવાનું નથી કે નિશાની કરવાની નથી તે બરાબર યાદ રાખશો. ગણિતના પ્રશ્નોમાં કાચું કામ કરવા માટે તમને જુદા કાગળ આપવામાં આવશે,

: ઘ : તમે તમારૂ કામ શરૂ કરો તે પહેલાં દરેક પેટા કસોટીમાં કઇ રીતે કામ કરવાનું છે તે બરાબર સમજી લેશો. દરેક પેટાકસોટી માટેની જરૂરી સૂચના શરૂઆતમાં આપેલી છે જે તમને સમજાવવામાં આવશે. છતાં પણ જો સમજ ન પડે તો, આંગળી ઊંચી કરીને, પરીક્ષકને પૂછી લેશો. એક વખત પેટા કસોટી શરૂ કર્યા પછી તમને પ્રશ્ન પૂછવા દેવામાં નહિ આવે

: ચ : ઉત્તરપત્રમાં દરેક પ્રશ્ન માટે ક, ખ અને ગ માંથી જે જવાબ સાચો હોય તે અક્ષર પર પ્રશ્નના યોગ્ય ક્રમ સામે ચોકડી (×) કરવાની છે. જેમ કે ક ખ ગ જો ખોટી જગાએ ચોકડી થઇ જાય તો તેના પર બે આડી લીટી કરી જે બીજો જવાબ સાચો લાગે તેના પર ચોકડી કરશો. જેમ કે, ~~ક~~ ખ ગ જો તમે આ કસોટીઓ ઉપર દિલ દઇને, કાળજીપૂર્વક કામ કરશો તો તેના પર મેળવેલા ગુણ આ કસોટીઓ દ્વારા મપાતી શક્તિઓમાં તમારું સ્થાન ક્યાં છે તેનો સારો એવો ખ્યાલ તમને આપશે.

હવે આપણે ~~એક~~ એક પછી એક પેટા કસોટી લઇશું.

પેટા–કસોટી ૧ માટેની સૂચનાઓ

આ પેટાકસોટી-૧ માં તમને ૨૫ શબ્દોની યાદી આપેલી છે. દરેક શબ્દ માટે તેની નીચે જુદા જુદા ત્રણ અર્થો આપેલા છે. તેમાથી જે અર્થ સૌથી વધુ સાચો લાગે તે શોધી કાઢવાનો છે. દરેક શબ્દ માટે આપેલા ત્રણ જવાબોમાંથી એક અને ફકત એક જ સાચા અર્થવાળો જવાબ આપેલો છે તે યાદ રાખશો. જે અર્થ સાચો હોય તેનો અક્ષર : ક, ખ, ગ : ઉત્તરપત્રમાંથી શોધી કાઢી, યોગ્ય ક્રમની સામેના તે અક્ષર પર ચોકડી કરવાની છે.

ઉદાહરણ તરીકે,

રવિ :

(ક) ચંદ્ર (ખ) સૂર્ય (ગ) રજા

અહીંઆ "રવિ" નો સાચો અર્થ (ખ) સૂર્ય થાય છે. બાકીના બે જવાબો ખોટા છે. બરાબર ને ? તો ઉત્તરપત્રમાં હવે જુઓ, ઉદાહરણની સામે : ખ : પર ચોકડીની નિશાની (×) કરેલી છે. : ક ગ : અહીંઆ નીચે બે મહાવરા પ્રશ્નો આપેલા છે. દરેક પ્રશ્નમાં સાચો જવાબ શોધી કાઢી ઉત્તરપત્રમાં મહાવરા પ્રશ્નો સાથે જે જવાબ સાચો હોય તે અક્ષર પર ચોકડીની નિશાની કરી જવાબ આપો. ધ્યાન રાખો કે તમારે આ કસોટી પુસ્તિકામાં કોઈ જગ્યાએ કશું જ લખવાનું નથી કે કોઇ જાતની નિશાની કે ચિહન કરવાનાં નથી. તમારે તમારો જવાબ ઉત્તરપત્રમાં જ આપવાનો છે ચાલો ત્યારે, નીચેના બે મહાવરા પ્રશ્નોના જવાબો ઉત્તરપત્રમાં ચોકડી કરીને આપો.

મહાવરા પ્રશ્નો

(અ) દિન

(ક) દિવસ (ખ) ગરીબ (ગ) લાચાર

(બ) શિશુ

(ક) માથું (ખ) ચંદ્ર (ગ) બાળક

(થોડીવાર પછી) ચાલો, અટકી જાઓ. હવે આપણે જોઈ લઇએ કે તમારા જવાબો સાચા છે કે નહિ ? મહાવરા પ્રશ્ન (અ) માં (ક) જવાબ સાચો છે. કેટલાનો ખરો છે. ? જેનો ખરો હોય તે હાથ ઊંચો કરે. જેઓએ ખોટી જગ્યાએ ચોકડી કરી હોય તેઓ તેના પર બે આડી લીટી કરી સાચા જવાબ (ક) પર ✓ ચોકડી કરે (પાટિયા પર દર્શાવવું) મહાવરા પ્રશ્ન (બ) માં (ગ) જવાબ સાચો છે. બરાબર ને ? જેઓનો ખોટો જવાબ હોય તે હમણાં સમજાવ્યું તે રીતે પોતાનો જવાબ સુધારી લે.

જવાબ આપવાની રીત બરાબર સમજી ગયા ને ? કોઇને કંઈ પ્રશ્ન પૂછવો હોય તો હમણાં જ પૂછી લો. પેટાકસોટી શરૂ કર્યા પછી તમે કશું જ પૂછી શકશો નહિ (થોડો સમય થોભવું)

યાદ રાખો કે તમારે તમારો જવાબ ઉત્તરપત્રમાં યોગ્ય પ્રશ્ન ક્રમની સામે યોગ્ય અક્ષર પર ચોકડી કરીને આપવાનો છે

આ કસોટી પુસ્તિકામાં તમારે કશું જ લખવાનું નથી કે નિશાની કરવાની નથી તે યાદ રાખશો.

ચાલો ત્યારે, શરૂ કરો. (પાનું ફેરવો)

પેટા કસોટી–૧

પ્રશ્ન સંખ્યા : ૨૫ **સમય : ૯ મિનિટ**

૧ પ્રભાત :

(ક) સાંજ (ખ) બપોર (ગ) સવાર

૨ અપરાધ :

(ક) ગુનો (ખ) પરાધીન (ગ) બરાબ

૩ સહારો :

(ક) રણપ્રદેશ (ખ) આધાર (ગ) મેળાપ

૪ મિજાજ :

(ક) તિરસ્કાર (ખ) મિજબાની (ગ) ગુસ્સો

૫ સૂઝ :

(ક) જ્ઞાન (ખ) સમજ (ગ) ભૂલી ગયેલું

૬ ફરમાન :

(ક) હુકમ (ખ) ભલામણ (ગ) હકક

૭ વિલાપ :

(ક) રૂદન (ખ) આલાપ (ગ) નિરાશા

૮ ભાવિ :

(ક) સમય (ખ) ભાવુક (ગ) ભવિષ્ય

૯ સંપત્તિ :

(ક) વિપત્તિ (ખ) ધન (ગ) કીર્તિ

૧૦ સંકલ્પ :

(ક) તૈયારી (ખ) વિકલ્પ (ગ) નિશ્ચય

૧૧ ફોરમ :

(ક) સુગંધ (ખ) તીવ્રવાસ (ગ) ફૂલડાં

૧૨ વેરાન

(ક) પથરાળ (ખ) જંગલી (ગ) ઉજ્જડ

૧૩ વાચા :

(ક) વાણી (ખ) અવાજ (ગ) વાચન

૧૪ મશહૂર :

(ક) જોવાલાયક (ખ) પ્રખ્યાત (ગ) મશગૂલ

૧૫ નાદાન :

(ક) ભોળું (ખ) દયાળુ (ગ) અણસમજુ

(આગળ જાઓ)

૧૬ પાવન :

(ક) સ્વચ્છ (ખ) પવિત્ર (ગ) નિર્મળ

૧૭ મૃદુ :

(ક) સુંદર (ખ) કોમળ (ગ) માટી

૧૮ સરિતા :

(ક) નદી (ખ) સરોવર (ગ) ઝરણું

૧૯ પ્રોત્સાહન :

(ક) મહેનત (ખ) ઉત્તેજન (ગ) આનંદ

૨૦ પ્રતિષ્ઠા :

(ક) મહત્ત્વ (ખ) રાહ (ગ) આબરૂ

૨૧ ઉમદા :

(ક) ઉપયોગી (ખ) ઉત્તમ (ગ) ફળનું નામ

૨૨ ધારતી :

(ક) ડર (ખ) કંપારી (ગ) નાસભાગ

૨૩ એંધાણ :

(ક) આધાર (ખ) દેખાવ (ગ) નિશાની

૨૪ મનસૂબો :

(ક) ઈરાદો (ખ) મનનો સૂબો (ગ) આયોજન

૨૫ બળવો :

(ક) અવરોધ (ખ) બંડ (ગ) યુદ્ધ

તમને કહેવામાં આવે ત્યારે જ આગળ જાઓ.

જો તમે કામ પૂરું કરી દીધું હોય તો આજ પેટા-કસોટી ૧ ના જે પ્રશ્નો ન કર્યા હોય તે ફરીથી જુઓ.

કહેવામાં ન આવે ત્યાં સુધી પાનું ફેરવશો નહિ (અટકો જાઓ)

પેટા-કસોટી ૨ માટેની સૂચનાઓ

પેટા-કસોટી ૨માં ગણિતના સાદી ગણતરીના ૨૫ પ્રશ્નો છે. દરેક પ્રશ્ન નીચે ત્રણ જવાબો આપેલા છે. તે પૈકી ફક્ત એક જ જવાબ સાચો છે. દરેક પ્રશ્ન માટેની ગણતરી મોઢે કરી શકો છો અથવા જરૂર પડે તો જુદા કાગળ પર કરી શકો છો. ત્યાર પછી પ્રશ્ન નીચે આપેલા ત્રણ જવાબો જુઓ અને તેમાંથી જે જવાબ સાચો હોય તેનો અક્ષર : 'ક, ખ, ગ : ઉત્તરપત્રમાંથી શોધી કાઢો, પ્રશ્નના યોગ્ય ક્રમ સામેના તે અક્ષર પર ચોકડી (×) કરશો.

ઉદાહરણ તરીકે,

૫૫૫ – ૧૬૧ = ?

(ક) ૨૮૪ (ખ) ૨૯૪ (ગ) ૩૯૪

અહીં સાચો જવાબ (ગ) છે. માટે ઉત્તરપત્રમાં પેટા-કસોટી ૨ વિભાગમાં "ઉદાહરણ" સામેના ક, ખ, ગ માંથી (ગ) પર ચોકડી કરેલી છે, તે જુઓ. આ જ પ્રમાણે, હવે, એક પછી એક પ્રશ્ન લો. સાચો જવાબ શોધો અને પ્રશ્નના યોગ્ય ક્રમ સામે, સાચા અક્ષર પર ચોકડી કરો. ચોક્કસ રાખો કે આ કસોટી-પુસ્તિકામાં તમારે કશું જ લખવાનું નથી કે નિશાની કરવાની નથી.

ચાલો, શરૂ કરો.

પેટા — કસોટી ૨

પ્રશ્નસંખ્યા : ૨૫ સમય : ૧૯ મિનિટ

૧ ૩૩૩ + ૫૪૯૫ = ?

(ક) ૫૭૨૮ (ખ) ૫૮૨૮ (ગ) ૮૮૨૫

૨ ૪ × ૫૯૧ = ?

(ક) ૨૩૬૪ (ખ) ૨૩૨૪ (ગ) ૨૨૬૪

૩ ૩૬૫૫ ÷ ૧૭ = ?

(ક) ૨૦૫ (ખ) ૨૧૫ (ગ) ૨૨૫

૪ d×d×d ને ટૂંકમાં દર્શાવીએ તો શું થાય ?

(ક) 3d (ખ) d + 3 (ગ) d^3

૫ ૨૧૩.૧ + ૨૧.૩૧ + ૨.૧૩૧ = ?

(ક) ૨૩૭.૫૪૧ (ખ) ૪૨૬.૧ (ગ) ૨૩૬.૫૪૧

૬ (− ૩) ની વિરોધી સંખ્યા કઈ થાય ?

(ક) ૩ (ખ) ૧/૩ (ગ) − ૧/૩

૭ ૦૬ − ૩ = ?

(ક) ૩ (ખ) ૦.૩ (ગ) ૦ ૨૭

૮ ૧૨ d − ૫ d = ?

(ક) ૭ (ખ) ૭d (ગ) ૭d^2

૯ ૪ રૂપિયા ૧૪ પૈસા − ૩ = ?

(ક) ૧.૩૧ રૂપિયા (ખ) ૧.૩૭ રૂપિયા (ગ) ૧.૩૮ રૂપિયા

૧૦ ૧૦૦૦ − ૧૧૧ = ?

(ક) ૮૮૬ (ખ) ૮૬૬ (ગ) ૬૬૬

૧૧ ૧૦ : ૫ = ૪૦ : ?

(ક) ૮ (ખ) ૨૦ (ગ) ૮૦

૧૨ એક પૂર્ણકોણ બરાબર કેટલા કાટખૂણા થાય ?

(ક) ૨ (ખ) ૪ (ગ) ૮

૧૩ ૨ + ૦.૦૦૨૨ = ?

(ક) ૦.૦૦૨૨૨ (ખ) ૦.૨૦૨૪ (ગ) ૨ ૦૦૨૨

૧૪ બે રેખાઓને છેદવાથી બનતા અભિકોણોમાં એકનું માપ ૭૦° છે તો તેની બાજુનો ખૂણો કેટલા અંશનો બને ?

(ક) ૧૧૦° (ખ) ૭૦° (ગ) ૨૦°

૧૫ ૦ ૦૨ × ૧.૩૨ = ?

(ક) ૦.૦૨૬૪ (ખ) ૨.૬૪ (ગ) ૨.૬૪૦૦

૧૬ $(-૪) \times (-૨) \times (-૧) = ?$

(ક) ૮ (ખ) −૭ (ગ) −૮

૧૭ સમબાજુ ત્રિકોણના દરેક ખૂણાનું માપ_____થાય

(ક) ૬૦° (ખ) ૪૫° (ગ) ૯૦°

૧૮ ૧૦૦૦^{1}, ૧૦૦^{10}, અને ૧^{1000} માં કઈ સંખ્યા સૌથી નાની છે ?

(ક) ૧૦૦૦^{1} (ખ) ૧૦૦^{10} (ગ) ૧^{1000}

૧૯ $૧૦૧૦૧૧_{બે}$ ની કિંમત ભારતીય અંકપદ્ધતિમાં કેટલી થાય ?

(ક) $૪૩_{દસ}$ (ખ) $૪૨_{દસ}$ (ગ) $૩૪_{દસ}$

૨૦ ૧૧૧.૧૧ − ૧.૧૧૧ = ?

(ક) ૧૧૦.૯૯૯ (ખ) ૯૯.૯૯૯ (ગ) ૧૦૯.૯૯૯

૨૧ ૪d = ૪૪ ના સમીકરણનું બીજ_____થાય.

(ક) ૪૦ (ખ) ૧૧ (ગ) ૪૮

૨૨ ૫ ક્વિન્ટલ ૧૫ કિલોગ્રામના કેટલા કિલોગ્રામ થાય ?

(ક) ૫૧૫ (ખ) ૫૧૫ (ગ) ૫૦૧૫

૨૩ ૪^{2}, ૨^{3}, અને $\sqrt{૬૪}$ માંથી કઈ સંખ્યા સૌથી મોટી થશે ?

(ક) ૪^{2} (ખ) ૨^{3} (ગ) $\sqrt{૬૪}$

૨૪ $(+૭) + (-૧૧) = ?$

(ક) ૧૮ (ખ) −૧૮ (ગ) −૪

૨૫ ૨/૫ − ૨/૫ = ?

(ક) ૪/૨૫ (ખ) ૦ (ગ) ૧

તમને કહેવામાં આવે ત્યારે જ આગળ જાઓ

જો તમે કામ પૂરું કરી લીધું હોય તો આ જ પેટા-કસોટી ૨ ના જે પ્રશ્નો ન કર્યા હોય તે ફરીથી જુઓ.

કહેવામાં ન આવે ત્યાં સુધી પાનું ફેરવશો નહિ.

પેટા-કસોટી ૩ માટેની સૂચનાઓ

પેટા-કસોટી ૩ માં ૨૫ વાક્યો આપેલાં છે. દરેક વાક્યમાં એક ખાલી જગ્યા છે જેમાં એક શબ્દ ખૂટે છે વાક્યની નીચે જુદા જુદા ત્રણ શબ્દો આપેલા છે. જે પૈકી એક જ શબ્દ વાક્ય માટે સાચો છે. તમારે આ સૌથી વધુ બંધબેસતો સાચો શબ્દ શોધી કાઢવાનો છે અને પછી ઉત્તરપત્રમાં તે શબ્દ સાથે આપેલા અક્ષર : ક, ખ, ગ : ને ધ્યાનમાં રાખી યોગ્ય જગ્યાએ ચોકડી (×) કરવાની છે

ઉદાહરણ તરીકે,

શેરપા તેનસિંગે હિમાલયના સૌથી ઊંચા શિખર પર_____મેળવ્યો.

(ક) વિજય (ખ) આનંદ (ગ) સંતોષ

અહીં સાચો જવાબ (ક) છે. માટે ઉત્તરપત્રમાં પેટા-કસોટી ૩ વિભાગમાં "ઉદાહરણ" સામેના ક, ખ, ગ માંથી (ક) પર ચોકડી કરેલી છે, તે જુઓ. આ જ પ્રમાણે હવે એક પછી એક વાક્ય વાંચો; વાક્યમાં સૌથી વધુ બંધબેસતો થતો હોય તે શબ્દ શોધી કાઢો અને ઉત્તરપત્રમાં વાક્યના ક્રમનો બરાબર ખ્યાલ રાખી, સાચા અક્ષર પર ચોકડી કરો. યાદ રાખો કે આ કસોટી-પુસ્તિકામાં તમારે કશું જ લખવાનું નથી કે નિશાની કરવાની નથી.

ચાલો, શરૂ કરો.

પેટા-કસોટી ૩

પ્રશ્નસંખ્યા : ૨૫ સમય : ૮ મિનિટ

૧ આફ્રિકાના જંગલો એટલાં બધાં_____છે કે તેમાં થઈને સૂર્યનાં કિરણો પસાર થઈ શકતાં નથી.

(ક) મોટાં (ખ) ગીચ (ગ) લાંબા પહોળાં

૨. જો જમીન_____હોય તો પાક પુષ્કળ પાકે.

(ક) ગોરાડુ (ખ) પોચી (ગ) ફળદ્રુપ

૩. રમેશને પતંગ ચગાવવાનો ભારે_____છે.

(ક) શોખ (ખ) શોક (ગ) આનંદ

૪. યુદ્ધના સમયમાં દેશની પડખે ઊભા રહેવું એ આપણી_____છે.

(ક) મરદાનગી (ખ) હિંમત (ગ) ફરજ

૫. કંઈ લાખો નિરાશામાં અમર _____ છુપાઇ છે.
(ક) આશા (ખ) ધીરજ (ગ) શક્તિ

૬ કોઇ શુભ કાર્ય માટે મોતને ભેટનાર વ્યક્તિને_____કહે છે.
(ક) ભાગ્યશાળી (ખ) શહીદ (ગ) મહાન

૭ મધર ટેરેસા કહે છે કે_____એ જ ધર્મ છે.
(ક) ઈશ્વર (ખ) સત્ય (ગ) સેવા

૮ આંગણે આવેલા_____નું સ્વાગત કરવું એ મોટો લહાવો છે
(ક) ગરીબ (ખ) અતિથિ (ગ) દુઃખી

૯ આપણા દેશમાં કેટલાંય બાળકોને કેળવણી ન મળવાથી_____રહે છે.
(ક) અભણ (ખ) બેકાર (ગ) નિરાધાર

૧૦ જે વિસ્તારમાં વરસાદ ઓછો પડતો હોય ત્યાંના ખેડૂતોએ સારો પાક લેવા માટે _____નો ઉપયોગ કરવો જોઇએ.
(ક) ખાતર (ખ) ખેડ (ગ) સિંચાઇ

૧૧ એક આંખવાળા પટોડીએ રમતગમતની દુનિયામાં _____ના બળે અશક્ય બાબતને શક્ય બનાવી
(ક) ધીરજ (ખ) પુરૂષાર્થ (ગ) કટકાબાજી

૧૨ ભારતે આઝાદી_____ને માર્ગે મેળવી.
(ક) ધીરજ (ખ) યુદ્ધ (ગ) અહિંસા

૧૩ બીજાંઓનાં હિત અંગે કોઇપણ જાતનો વિચાર ન કરનાર વ્યકિત સમાજમાં_____ ગણાય છે.
(ક) સ્વાર્થી (ખ) પરગજુ (ગ) બુદ્ધિશાળી

૧૪ ગંદકી કરવી એ સમાજમાં પેઠેલું એક _____ છે.
(ક) પાપ (ખ) દુષણ (ગ) જોખમ

૧૫ ક્ષમાની આડે_____આવે છે.
(ક) અભિમાન (ખ) ધર્મ (ગ) વેર

૧૬ _____તેને જઈ વરે, જે પરસેવે ન્હાય.
(ક) મહેનત (ખ) લક્ષ્મી (ગ) સિદ્ધિ

૧૭ જીવનમાં સતત_____ને સ્થાન આપનાર વ્યકિતઓએ જ સફળતાના શિખરો સર કર્યા છે.
(ક) પરિશ્રમ (ખ) શાંતિ (ગ) ધીરજ

૧૮ રવિશંકર મહારાજે કરેલાં_____નાં કાર્યોને લીધે તેમને "મહારાજ" નું બિરૂદ આપવામાં આવ્યું.
(ક) પ્રભુહિત (ખ) રાષ્ટ્રહિત (ગ) જનહિત

૧૯ ભારતનાં ગામડાં_____હોય તેમાં જ આપણી શોભા છે.
(ક) સુઘડ (ખ) આઝાદ (ગ) નાનાં

૨૦ ગાંધીજી કોઇપણ કામ કરવામાં જરાપણ_____અનુભવતા નહિ.
(ક) શરમ (ખ) મુશ્કેલી (ગ) થાક

૨૧ આપણામાં કહેવત છે કે પુત્રનાં લક્ષણ પારણામાંથી અને વહુનાં લક્ષણ_____માંથી
(ક) પિયેર (ખ) સાસરા (ગ) બારણા

૨૨ _____વિના પ્રારબ્ધ પાંગળું છે
(ક) જ્ઞાન (ખ) પુરુષાર્થ (ગ) પ્રભુ

૨૩ હરિનો મારગ છે_____, નહીં કાયરનું કામ જોને.
(ક) ધીરજનો (ખ) શૂરાનો (ગ) કંટકભર્યો

૨૪ દેશનો દરેક નાગરિક_____બને તો દેશ ખૂબ ઝડપથી આબાદ બને.
(ક) સ્વાશ્રયી (ખ) નેતા (ગ) આઝાદ

૨૫ યાહોમ કરીને પડો,_____છે આગે.
(ક) ખાડો (ખ) ફરોહ (ગ) ઈશ્વર

તમને કહેવામાં આવે ત્યારે જ આગળ જાઓ.

જો તમે કામ પૂરું કરી દીધું હોય તો આ જ પેટા-કસોટી ઉના જે પ્રશ્નો ન કર્યા હોય તે ફરીથી જુઓ.

કહેવામાં ન આવે ત્યાં સુધી પાનું ફેરવશો નહિ.

(અટકો જાઓ)

પેટા-કસોટી ૪ માટેની સૂચનાઓ

આ છેલ્લી પેટા-કસોટી ૪માં પણ ૨૫ ગણિતના પ્રશ્નો છે. દરેક પ્રશ્ન નીચે ત્રણ જવાબો આપેલા છે તે પૈકી ફક્ત એક જ જવાબ સાચો છે. દરેક પ્રશ્ન માટેની ગણતરી, જરૂર હોય તો જુદા કાગળ પર કરશો. ત્યારપછી પ્રશ્ન નીચે આપેલા ત્રણ જવાબો જુઓ અને તેમાંથી કયો જવાબ સાચો છે તે શોધી કાઢો. જે જવાબ સાચો હોય તેનો અક્ષર : ક, ખ, ગ : ઉત્તરપત્રમાંથી શોધી કાઢી, પ્રશ્નના યોગ્ય ક્રમ સામેના તે અક્ષર પર ચોકડી (×) કરશો.

ઉદાહરણ તરીકે,

૪૦, ૫૦ અને ૬૬ રનના સરાસરી રન કેટલા થાય ?

(ક) ૫૦ (ખ) ૫૨ (ગ) ૫૬

અહીં સાચો જવાબ (ખ) છે. માટે ઉત્તરપત્રમાં પેટા-કસોટી ૪ વિભાગમાં "ઉદાહરણ" સામેના ક, ખ, ગ માંથી (ખ) પર ચોકડી કરેલી છે તે જુઓ. આ જ પ્રમાણે, હવે, એક પછી એક પ્રશ્ન લો; સાચો જવાબ ગણતરી કરીને શોધી કાઢો અને પ્રશ્નના યોગ્ય ક્રમ સામે, સાચા અક્ષર પર ચોકડી કરો. યાદ રાખો કે આ કસોટી-પુસ્તિકામાં તમારે કશું જ લખવાનું નથી કે નિશાની કરવાની નથી.

ચાલો, શરૂ કરો.

પેટા — કસોટી ૪

પ્રશ્ન સંખ્યા : ૨૫ સમય : ૧૮ મિનિટ

૧ પાંચ રૂપિયાના ૨૫ પૈસાવાળા કેટલા સિક્કા મળે ?

(ક) ૨૦ (ખ) ૨૫ (ગ) ૧૨૫

૨ એક પેટી ૧૦ ડે. મી. લાંબી, ૫ ડે. મી. પહોળી અને ૬ ડે. મી. ઊંચી છે તો તેનું ઘનફળ કેટલા ઘન ડેસીમીટર થાય ?

(ક) ૨૧ (ખ) ૧૫૦ (ગ) ૩૦૦

૩ રૂા. ૧૦૦ ની કિંમતનો શેર ૧૦ ટકા ચઢતા ભાવે છે તો તેનો બજાર ભાવ કેટલા રૂપિયા થાય ?

(ક) ૧૦ (ખ) ૧૧૦ (ગ) ૧૧૧

૪ એક કુટુંબમાં દરરોજ ૩ લીટર દૂધનો વપરાશ છે અને દૂધનો ભાવ લીટરનો ૨.૦૦ રૂા. છે. તો નવેમ્બર માસનું દૂધનું બિલ કેટલું આવશે ?

(ક) ૧૮૦ રૂપિયા (ખ) ૧૮૬ રૂપિયા (ગ) ૧૭૪ રૂપિયા

૫ કેટલા ટકા લેખે ૨ વર્ષનું ૫૦૦ રૂપિયાની રકમનું વ્યાજ ૧૦૦ રૂપિયા થાય ?

(ક) ૫ (ખ) ૬.૨૫ (ગ) ૧૦

૬ (–૭) થી (–૩) પર પહોંચવા માટે સંખ્યા રેખા પર જમણી બાજુ તરફ કેટલા એકમ અસવું પડે ?

(ક) ૩ (ખ) ૪ (ગ) ૧૦

૭ ૬૬૬ રૂપિયા ટીનુ, ચિનુ અને વિનુ વચ્ચે ૧:૨:૩ ના પ્રમાણમાં વહેંચતા ચિનુને ભાગે કેટલા રૂપિયા આવે ?

(ક) ૧૧૧ (ખ) ૨૨૨ (ગ) ૩૩૩

૮ એક ખુરશીની કિંમત b રૂપિયા હોય તો તેવી ૫ ખુરશીની કિમત કેટલા રૂપિયા થાય ?

(ક) b–૫ (ખ) b+૫ (ગ) ૫b

૯ મેં એક સંખ્યા ધારી, તેને ૫ ગણી કરી અને મળેલ પરિણામમાં ૧૫ ઉમેર્યા; ધારો કે મારો જવાબ ૭૫ આવ્યો હોય તો મેં ધારેલી સંખ્યા કઇ હશે ?

(ક) ૧૨ (ખ) ૧૮ (ગ) ૫૫

૧૦ જો PQR $\leftrightarrow$ DEF હોય અને માપ $\angle P=૪૦^\circ$ અને માપ $\angle Q=૬૦^\circ$ હોય તો માપ $\angle F$ બરાબર કેટલા અંશ થાય ?

(ક) ૪૦° (ખ) ૮૦° (ગ) ૧૦૦°

૧૧ રાકેશ અને રોશનની કામ કરવાની ઝડપ સરખી છે જો રાકેશ એક કામ ૪ દિવસમાં કરી શકતો હોય તો રાકેશ અને રોશન બંને સાથે તે કામ કેટલા દિવસમાં કરી શકે ?

(ક) ૮ (ખ) ૪ (ગ) ૨

૧૨ ૪૦૦ રૂ. નુ બે વર્ષનું ૭ ટકાના દરે સાદું વ્યાજ કેટલું થાય ?

(ક) ૫૬ (ખ) ૨૮ (ગ) ૧૪

૧૩ એક માણસ ૪ દિવસમાં ૧/૨ ભાગનું કામ કરે છે તો એક દિવસમાં કેટલું કામ કરી શકે ?

(ક) ૧/૩ (ખ) ૧/૪ (ગ) ૧/૮

૧૪ પ્રમાણમાપ ૧ સે.મી.=૧૦ મીટર હોય તો ૫૦ મીટર અંતર દર્શાવવા કેટલા સે.મી ની લંબાઇનો રેખાખંડ દોરવો પડે ?

(ક) ૫ (ખ) ૫૦ (ગ) ૫૦૦

૧૫ રૂ. ૨૨૪ ને નીના, મીના અને હીના વચ્ચે એવી રીતે વહેંચો કે જેથી નીના કરતાં મીનાને બમણા રૂપિયા મળે અને મીના કરતાં હીનાને બમણા રૂપિયા મળે. આ રીતે નીનાને કેટલા રૂપિયા મળશે ?

(ક) ૩૨ (ખ) ૬૪ (ગ) ૯૬

૧૬ ૧૦.૫૦ રૂપિયાના કિલોગ્રામના ભાવે ૪.૫૦૦ કિલોગ્રામ તેલના કેટલા રૂપિયા ચૂકવવા પડે ?
(ક) ૯૪.૫૦ (ખ) ૪૭.૨૫ (ગ) ૪૫.૨૫

૧૭ કેટલા વર્ષમાં ૧૨ ટકાના દરે ૨૦૦ રૂપિયાની રાશ ૩૨૦ રૂ. થાય ?
(ક) ૫ વર્ષ (ખ) ૨૧ વર્ષ (ગ) ૨૬ વર્ષ ૬ માસ

૧૮ જો વિનિમયનો દર ૧ ડોલર=૯.૫ રૂપિયા હોય તો ૨૦ ડોલરની કિંમતની ઘડિયાળ માટે કેટલા રૂપિયા ચૂકવવા પડે ?
(ક) ૧૯૦૦ (ખ) ૧૯૦ (ગ) ૧૯

૧૯ એક મેચમાં ગવાસ્કર અને વિશ્વનાથે કરેલા રનનો ગુણોત્તર ૭:૫ છે જો ગવાસ્કરના ૯૮ રન હોય તો તે મેચમાં બંનેના મળી કુલ કેટલા રન થયા હશે ?
(ક) ૧૧૦ (ખ) ૧૬૮ (ગ) ૧૭૮

૨૦ ૨૫ સેં. મી. લાંબી, ૨૦ સેં.મી. પહોળી અને ૧૦ સેં.મી. ઊંચી પેટીમાં ૫ સેં.મી. લાંબી, ૪ સેં મી. પહોળી અને ૨ સેં.મી. જાડી એવી કેટલી ધાતુની પટ્ટીઓ સમાશે ?
(ક) ૫ (ખ) ૧૨૫ (ગ) ૨૫૦

૨૧ એક પેન અને એક બૉલપેન ૭ રૂપિયામાં ખરીદ કર્યા. જો પેન કરતાં બૉલપેનની કિંમત ૧ રૂપિયો ઓછી હોય તો પેનની કિંમત કેટલા રૂપિયા હશે ?
(ક) ૪ (ખ) ૫ (ગ) ૬

૨૨ એક મોટર ગાડીની ઝડપ કલાકના ૬૦ કિલોમીટર હોય તો ૩ કલાક ૧૦ મિનિટમાં તે કેટલું અંતર કાપશે ?
(ક) ૧૮૦ (ખ) ૧૮૬ (ગ) ૧૯૦

૨૩ ૧૦૦ અને ૧૨૦ ને જેના વડે ભાગતાં અનુક્રમે ૫ અને ૬ શેષ વધે એવી મોટામાં મોટી સંખ્યા શોધો.
(ક) ૧૯ (ખ) ૨૦ (ગ) ૧૧૪

૨૪ ચાર ક્રમિક સંખ્યાઓનો સરવાળો ૭૮ થતો હોય તો તેમાં સૌથી નાની સંખ્યા કંઈ હશે ?
(ક) ૧૨ (ખ) ૧૬ (ગ) ૧૮

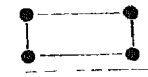
૨૫ ૧૧૦ રૂપિયામાં એક વસ્તુ વેચતાં ૧૦ રૂ. ખોટ જતી હોય તો તે જ વસ્તુ ૧૫૦ રૂ.માં વેચતાં કેટલા રૂપિયા નફો થાય ?
(ક) ૫૦ (ખ) ૩૦ (ગ) ૪૦

સહકાર બદલ આભાર

APPENDIX C

પ્રાથમિક શાળા સિદ્ધિ કસોટીઓનું ઉત્તર પત્ર

B/G
U/S. U./R



નામ _____

(અટક) (નામ) (પિતાનું નામ)

છોકરો/છોકરી _____ ધોરણ _____ આજની તારીખ _____

શાળાનું નામ _____ જન્મ તારીખ _____

સ્થળ _____ જિલ્લો _____

●

પેટા-કસોટી-૧

ઉદાહરણ :

ક	~~ખ~~	ગ

મહાવરા પ્રશ્નો :

(અ) ક ખ ગ

(બ) ક ખ ગ

પ્રશ્નો :

(૧) ક ખ ગ
(૨) ક ખ ગ
(૩) ક ખ ગ
(૪) ક ખ ગ
(૫) ક ખ ગ
(૬) ક ખ ગ
(૭) ક ખ ગ
(૮) ક ખ ગ
(૯) ક ખ ગ
(૧૦) ક ગ
(૧૧) ક ખ ગ
(૧૨) ક ખ ગ
(૧૩) ક ખ ગ
(૧૪) ક ખ ગ
(૧૫) ક ખ ગ
(૧૬) ક ખ ગ
(૧૭) ક ખ ગ
(૧૮) ક ખ ગ
(૧૯) ક ખ ગ
(૨૦) ક ખ ગ
(૨૧) ક ખ ગ
(૨૨) ક ખ ગ
(૨૩) ક ખ ગ
(૨૪) ક ખ ગ
(૨૫) ક ખ ગ

પેટા-કસોટી-૨

ઉદાહરણ :

ક	ખ	~~ગ~~

પ્રશ્નો :

(૧) ક ખ ગ
(૨) ક ખ ગ
(૩) ક ખ ગ
(૪) ક ખ ગ
(૫) ક ખ ગ
(૬) ક ખ ગ
(૭) ક ખ ગ
(૮) ક ખ ગ
(૯) ક ખ ગ
(૧૦) ક ખ ગ
(૧૧) ક ખ ગ
(૧૨) ક ખ ગ
(૧૩) ક ખ ગ
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(૧૫) ક ખ ગ
(૧૬) ક ખ ગ
(૧૭) ક ખ ગ
(૧૮) ક ખ ગ
(૧૯) ક ખ ગ
(૨૦) ક ખ ગ
(૨૧) ક ખ ગ
(૨૨) ક ખ ગ
(૨૩) ક ખ ગ
(૨૪) ક ખ ગ
(૨૫) ક ખ ગ

●

(પાછળ જુઓ)

પેટા-કસોટી-૩

ઉદાહરણ :

✗	ખ	ગ

પ્રશ્નો :

(૧)	ક	ખ	ગ
(૨)	ક	ખ	ગ
(૩)	ક	ખ	ગ
(૪)	ક	ખ	ગ
(૫)	ક	ખ	ગ
(૬)	ક	ખ	ગ
(૭)	ક	ખ	ગ
(૮)	ક	ખ	ગ
(૯)	ક	ખ	ગ
(૧૦)	ક	ખ	ગ
(૧૧)	ક	ખ	ગ
(૧૨)	ક	ખ	ગ
(૧૩)	ક	ખ	ગ
(૧૪)	ક	ખ	ગ
(૧૫)	ક	ખ	ગ
(૧૬)	ક	ખ	ગ
(૧૭)	ક	ખ	ગ
(૧૮)	ક	ખ	ગ
(૧૯)	ક	ખ	ગ
(૨૦)	ક	ખ	ગ
(૨૧)	ક	ખ	ગ
(૨૨)	ક	ખ	ગ
(૨૩)	ક	ખ	ગ
(૨૪)	ક	ખ	ગ
(૨૫)	ક	ખ	ગ

પેટા-કસોટી-૪

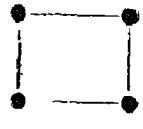
ઉદાહરણ :

ક	✗	ગ

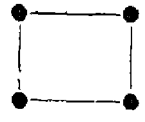
પ્રશ્નો :

(૧)	ક	ખ	ગ
(૨)	ક	ખ	ગ
(૩)	ક	ખ	ગ
(૪)	ક	ખ	ગ
(૫)	ક	ખ	ગ
(૬)	ક	ખ	ગ
(૭)	ક	ખ	ગ
(૮)	ક	ખ	ગ
(૯)	ક	ખ	ગ
(૧૦)	ક	ખ	ગ
(૧૧)	ક	ખ	ગ
(૧૨)	ક	ખ	ગ
(૧૩)	ક	ખ	ગ
(૧૪)	ક	ખ	ગ
(૧૫)	ક	ખ	ગ
(૧૬)	ક	ખ	ગ
(૧૭)	ક	ખ	ગ
(૧૮)	ક	ખ	ગ
(૧૯)	ક	ખ	ગ
(૨૦)	ક	ખ	ગ
(૨૧)	ક	ખ	ગ
(૨૨)	ક	ખ	ગ
(૨૩)	ક	ખ	ગ
(૨૪)	ક	ખ	ગ
(૨૫)	ક	ખ	ગ

૧



૩



APPENDIX : D

SELECTION OF SCHOOLS FOR THE FINAL RUN

Region : North Gujarat

(1) District : Banaskantha

Sl. No.	Place and area	Number allotted in Fig.1	Name of the school
1	Palanpur (U)	1	Vividh Laxi Vidya Mandir
2	Deesa (S-U)	11	S.C.W. High School
3	-do-	11	Adarsh High School
4	Chhapi (S-U)	12	Chhapi High School
5	Malan (R)	29	Malan High School
6	Jalotra (R)	30	Jalotra High School

(2) District : Mehsana

7	Mehsana (U)	2	M.M.V. Sarvajanik Girls' High School
8	Kalol (S-U)	13	Bharat High School
9	-do-	13	Vakharia High School
10	Piludra (R)	31	Shri Jagruti Vidyalaya

Region : South Gujarat

(3) District : Surat

11	Surat (U)	3	V.T. High School
12	Udhana (S-U)	14	R.N. Nayak High School
13	Vyara (S-U)	15	Dakshina Path High School
14	-do-	15	J.B. Sarvajanik High School
15	Vihan (R)	32	S.G. Vidyalaya

Sl. No.	Place and area	Number allotted in Fig.1	Name of the school
	(4) District : Valsad		
16	Valsad (U)	4	Sheth R.J.J. High School
17	Bilimora (S-U)	16	M.& R. Tata High School
18	-do-	16	J.J. Mehta Sarvajanik High School
19	Dungari (R)	33	Sarvajanik High School
20	Dharasana (R)	34	Nutan Vidyalaya
	Region : East Gujarat		
	(5) District : Panchmahals		
21	Godhra (U)	5	Telang High School
22	Lunawada (S-U)	17	Panchshil High School
23	-do-	17	S.K. High School
24	Timba Road(S-U)	18	M.B. Parikh Mahajan High School
25	Timbagam (R)	35	I.H. Sheth High School
26	Mara (R)	36	P.M. Patel High School
	Region : West Gujarat		
	(6) District : Kutch		
27	Bhuj (U)	6	Swami Narayan High School
28	-do-	6	Indirabai Girls' High School
29	Nakhtrana (S-U)	19	K.B. Government High School
30	Anjar (S-U)	20	Anjar Nagarpalika High School
31	-do-	20	K.K.M. Girls' High School
32	Mankuva (R)	37	Mankuva High School
33	Khedoi (R)	38	Khedoi High School

Sl. No.	Place and area	Number allotted in Fig.1	Name of the school
	(7) District : Rajkot		
34	Rajkot (U)	7	S.V. Virani High School
35	Padadhari (S-U)	21	Government Padadhari High School
36	Gondal (S-U)	22	A.P.S. High School
37	Tramba (R)	39	Vinay Mandir School
38	Kuvadava (R)	40	Kuvadava Gram Panchayat School
	(8) District : Bhavnagar		
39	Bhavnagar(U)	8	Dakshina Murti Vinay Mandir
40	Talaja (S-U)	23	Navkar Mantra Girls' School
41	Mahuva(S-U)	24	J.P. Parekh High School
42	Devagana (R)	41	Devagana Gram Panchayat School
	Region : Central Gujarat		
	(9) District : Ahmedabad		
43	Ahmedabad (U)	9	Diwan Ballubhai Madhyamik Shala Kankaria
44	-do-	9	Swastik Shishu Vihar, Navarangpura
45	Viramgam(S-U)	25	K.B. Shah Vinay Mandir
46	Sanand (S-U)	26	New Era High School
47	Fedara (R)	42	Fedara High School
48	Modasar (R)	43	Shri Shakti Vidyalaya
	(10) District : Kheda		
49	Nadiad (U)	10	New English School for Girls
50	Mahemadabad(S.U)	27	Sheth J.H. Sonawala High School
51	Dakor (S-U)	28	Shri Sansthan High School
52	Arera (R)	44	Nutan Vidyalaya

(U) Urban :: (S-U) Semi-urban :: (R) Rural

Summary :

	Nos.	Places	Nos. in Figure 1
Urban Schools	12	10	1 to 10
Semi-urban Schools	24	18	11 to 28
Rural Schools	16	16	29 to 44
Total	52	44	44

APPENDIX E

મનોવિજ્ઞાન, શિક્ષણશાસ્ત્ર અને તત્ત્વજ્ઞાન ભવન
ગુજરાત યુનિવર્સિટી

ડૉ. જયંતીભાઇ એચ. શાહ
શિક્ષણશાસ્ત્રના રીડર
રિસર્ચ પ્રોજેક્ટના સંશોધક

અમદાવાદ- ૩૮૦૦૦૯
જુલાઇ ૨૦, ૧૯૮૧

તાકીદનું

વિષય: ધોરણ ૮ ના એક વર્ગને " સિધ્ધ - કસોટીઓ " આપવા અંગે.....

માનનીયશ્રી,

નેશનલ કાઉન્સિલ ઓફ એજ્યુકેશનલ રિસર્ચ એન્ડ ટ્રેનિંગ : એન. સી. ઇ. આર. ટી :, ન્યુ દીલ્હી તરફથી ગુજરાત યુનિવર્સિટીના શિક્ષણશાસ્ત્ર ભવનના રીડર ડૉ. જે. એચ. શાહને એક સંશોધન પ્રોજેક્ટ મળેલો છે જેનો હેતુ સમગ્ર ગુજરાત રાજ્યના ધોરણ સાતમાં ઉતરીને આવનાર વિદ્યાર્થીઓની ભાષાકીય અને ગાણિતિક શક્તિઓ માપી તેઓની વિદ્યાકીય કક્ષા નક્કી કરવાનો છે જેથી ભવિષ્યમાં તેઓએ કયા પ્રકારનો અભ્યાસક્રમ લેવો જોઇએ તે અંગેનો ખ્યાલ મેળવી શકાય.

આ પ્રોજેક્ટમાં ભાષાની બે અને ગણિતની બે એમ મળીને કુલ ચાર પેટા-કસોટીઓ તૈયાર કરેલી છે. આ પેટા કસોટીઓ ગુજરાત રાજ્યના જુદા જુદા જિલ્લાઓમાં, જુદા જુદા સ્થળોની માધ્યમિક શાળાઓમાં આપવાની છે અને તે દ્વારા આ કસોટીમાળાનું પ્રમાણીકરણ કરવાનું છે. મને જણાવતાં આનંદ થાય છે કે આ કામ માટે રાજ્યની જે ૪૦ શાળાઓ પ્રસંદ કરવામાં આવી છે તેમાંની એક આપની પણ શાળા છે. આ પ્રોજેક્ટમાં કામ કરતા રિસર્ચ ફેલો શ્રી:શ્રીમતી:કુમારી---------- આપની શાળાની મુલાકાતે આવશે અને તે જ તે ધોરણ ૮ ના કોઇ એક વર્ગને આ ચાર પેટા-કસોટીઓ આપશે. આ માટે તેમને લગભગ બે તાસ જેટલો સમય ફાળવી આપશો તેવી વિનંતી છે. સમગ્ર કામ વૈજ્ઞાનિક પધ્ધતિએ થાય અને તે દ્વારા સાચાં અને યોગ્ય પરિણામો મેળવી શકાય તે માટે નીચેના જેવી બાબતોમાં આપ આપનો સહકાર આપી મને આભારી કરશો :

: ૬: છોકરાઓ અને છોકરીઓ લગભગ હોય તેવા એક સામાન્ય વર્ગની પસંદગી કરવી; અમુક હોશિયાર વિદ્યાર્થીઓનેજ આ કસોટી આપવાની નથી. બહેનોની સંખ્યા પૂરતી મળી રહે તે માટે ધોરણ

: ખ : પસંદ કરેલા વર્ગના વિદ્યાર્થીઓને અગાઉથી તેમની જન્મતારીખ જણાવી દઇને તેની નોંધ કરાવી લેવી.

: ગ : વિદ્યાર્થીઓને અલગ અલગ બેસાડી શકાય તેવા મોટા ઓરડામાં બેઠક વ્યવસ્થા કરવી.

: ઘ : ગણિતમાં ગણતરીઓનું કાચું કામ કરવા માટે વિદ્યાર્થીઓને પોતાની પાસે અલગ કાગળ રાખવા જણાવવું.

: ચ : કસોટીઓ આપવા ત્રીજો-ચોથો અથવા પાંચમો-છઠ્ઠો એવા બે તાસોનો સળંગ સમય આપવો.

: છ : નિરીક્ષણકાર્યમાં તેમજ અન્ય રીતે મદદ કરવા શિક્ષકમિત્રનો સહકાર આપવો.

: જ : ઉપરાંત, કોઇ વધુ સિનિયર પરંતુ પ્રભાવશાળી શિક્ષક કસોટી સમય દરમિયાન હાજર રહે તેવીગોઠવણ કરવી જેથી વિદ્યાર્થી સ્વપ્રયત્નથી જ કામ કરે.

પ્રોજેક્ટનું આ કામ ચોક્કસ સમય-મર્યાદામાં કરવાનું હોઇ તા. ૨૭ જુલાઇથી તા. ૩૧ જુલાઇ : તા. ૩ ઓગષ્ટથી તા. ૮ ઓગષ્ટ : વચ્ચે ગમે તે એક દિવસે આપની શાળામાં પ્રોજેક્ટના રિસર્ચ-ફેલો આવશે. શિક્ષણની દૃષ્ટિએ ઉપયોગી અને મહત્ત્વનો આ પ્રોજેક્ટ સારી રીતે પૂરો કરવામાં આપના સાથ અને સહકાર મળી રહેશે તેવી શ્રધ્ધા છે.

આભાર સહ,

ભવદીય,

: જ. હી. શાહ :

તા. ક. : આપની અનુકૂળ તારીખ જણાવતો મંજૂરી-પત્ર વળતી ટપાલે મોકલવા આગ્રહભરી વિનંતી છે. મંજૂરી-પત્રનો જવાબ આપવા માટે આ સાથે સરનામાવાળું પોસ્ટ-કાર્ડ મોકલવામાં આવે છે.

APPENDIX F

AREAWISE FREQUENCY DISTRIBUTIONS OF V, Q AND TOTAL SCORES FOR SEXWISE DIFFERENT AGE-GROUPS (A) URBAN AREA - V SCORES

class / Interval / Sex	AGE-GROUPS 11+ B	11+ G	12+ B	12+ G	13+ B	13+ G	14+ B	14+ G	15+ B	15+ G	16+ B	16+ G	17+ B	17+ G	Total B	Total G
46 - 50	--		8	7	3	11									11	18
41 - 45	1		18	28	21	18	1		1						42	46
36 - 40	1		18	27	27	23	3	1	4			1			53	52
31 - 35	2	1	20	15	17	14	7	5	8	2					54	37
26 - 30			13	9	11	17	12	3	1	3	1		2		40	32
21 - 25			4	9	16	22	5	4	4	-	4				33	35
16 - 20			8	5	10	6	7	6	1	2	4	1	2		32	20
11 - 15				2	3	2	1	1	2	1					6	6
6 - 10				1		1	1							1	1	2
N	4	1	89	103	108	114	37	20	21	8	9	2	4	1	272	249
Mean	36.75	33.0	34.85	35.38	32.54	33.0	26.68	25.0	29.66	24.87	21.33	28.0	23.0	8.0	31.87	32.93
SD	4.14	0.0	8.39	8.89	9.07	9.48	7.61	6.96	8.21	7.04	3.34	10.0	5.0	0.0	9.03	9.16

(A) URBAN AREA - Q SCORES

Class / Inter/ -val/Sex	AGE - GROUP														Total	
	11+		12+		13+		14+		15+		16+		17+			
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
46 - 50			1												1	
41 - 45			3		6	1	1		1						11	1
36 - 40			4	6	10	5									14	11
31 - 35	1		21	24	18	19	3		1						44	43
26 - 30	1		26	24	27	22	4	3	4	2	1				63	51
21 - 25	2	1	25	28	21	24	13	6	8			1	2		71	60
16 - 20			7	13	21	33	14	6	5	4	5		2		54	56
11 - 15			2	8	5	10	2	5	1	2	3	1		1	13	27
6 - 10									1						1	
N	4	1	89	103	108	114	37	20	21	8	9	2	4	1	272	249
Mean	26.75	23.0	27.83	25.96	26.90	24.14	22.47	19.75	23.0	19.25	17.44	18.0	20.50	13.0	25.92	24.82
SD	4.15	0.0	6.51	6.66	7.73	7.04	5.94	5.07	7.07	5.45	4.37	5.0	2.50	0.0	7.29	6.98

(A) URBAN AREA - TOTAL SCORES

Class// Inter/ -val/Sex →	AGE - GROUP 11+ B	11+ G	12+ B	12+ G	13+ B	13+ G	14+ B	14+ G	15+ B	15+ G	16+ B	16+ G	17+ B	17+ G	Total B	Total G
91 - 100			1												1	
81 - 90			5	3	6	4									11	7
71 - 80	1		21	30	18	20	1		1						42	50
61 - 70	2		21	28	40	25	6	1	5			1			74	55
51 - 60	1	1	27	16	13	23	10	7	7	2			2		60	49
41 - 50			9	16	17	23	9	3	4	3	3	1			42	46
31 - 40			4	8	13	17	10	7	3	2	5		2		37	34
21 - 30			1	2	1	2	1	2	1	1	1			1	5	8
N	4	1	89	103	108	114	37	20	21	8	9	2	4	1	272	249
Mean	65.50	55.50	62.47	61.23	59.72	56.72	49.19	44.50	52.64	43.0	37.72	55.50	45.50	25.50	57.85	57.62
SD	7.10	0.0	13.27	15.10	14.48	14.75	11.79	11.36	12.39	10.90	6.28	10.00	10.0	0.0	14.56	15.08

(B) SEMI-URBAN AREA - V SCORES

Class Interval / Sex	A G E - G R O U P														Total	
	11+		12+		13+		14+		15+		16+		17+			
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
46 - 50			7	5	8	2	1								16	7
41 - 45	2		26	7	19	8	3	6	4	1	3	1	2		59	23
36 - 40			26	20	30	15	14	5	2	1	1		3		76	41
31 - 35	2	1	35	31	35	28	20	16	12	2	4	1	1		109	79
26 - 30	1	3	23	21	44	33	22	16	17	6	6	5	7	3	121	87
21 - 25	1	1	22	13	39	22	19	10	17	10	8	3	7	2	113	61
16 - 20			6	8	29	20	24	15	17	5	8	8	11	5	95	61
11 - 15		1	1	2	7	7	8	3	8	1	4		3	1	31	15
6 - 10					1	1	3		3	1			1	1	8	3
N	6	6	146	107	212	136	115	71	80	27	34	18	35	12	628	377
Mean	33.83	25.5	33.34	31.60	29.47	28.11	26.17	27.65	24.34	24.30	24.92	23.84	23.71	20.08	28.57	28.24
SD	7.31	6.29	8.0	7.82	8.89	8.28	8.58	8.11	8.25	7.15	8.49	6.72	8.79	5.93	9.15	8.34

(β) SEMI-URBAN AREA – Q – SCORES

Class Interval / Sex →	AGE-GROUP 11+ B	11+ G	12+ B	12+ G	13+ B	13+ G	14+ B	14+ G	15+ B	15+ G	16+ B	16+ G	17+ B	17+ G	Total B	Total G
46 - 50	2			1	1										3	1
41 - 45			8		6		2	1				1			16	2
36 - 40			17	6	18	3	6	3			3				44	12
31 - 35			24	10	22	16	8	6	7	1	4		3		68	33
26 - 30		1	40	27	31	17	19	11	17	3	5	1	7		119	60
21 - 25	2	3	27	32	60	34	33	11	26	7	4	5	13	5	165	97
16 - 20	1	2	22	20	47	43	31	20	25	12	16	5	9	5	151	107
11 - 15	1		5	10	24	22	11	18	3	4	1	3	2	2	47	59
6 - 10			3	1	3	1	5	1	2		1	3	1		15	6
N	6	6	146	107	212	136	115	71	80	27	34	18	35	12	628	377
Mean	28.83	22.17	27.45	24.27	24.27	21.82	22.70	21.38	22.62	20.23	23.15	18.33	22.57	19.25	24.40	22.10
SD	13.97	3.44	7.96	6.98	8.11	6.51	7.47	7.77	5.58	4.97	7.52	8.21	5.65	3.61	7.84	7.01

(B) SEMI-URBAN AREA - TOTAL SCORES

AGE - GROUP

Class / Inter / -val / Sex →	11+		12+		13+		14+		15+		16+		17+		Total	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
91 -100							1								1	
81 - 90	1		20	2	14	1		1				1			35	5
71 - 80	1		24	7	17	14	10	3	3		2		1		58	24
61 - 70			25	27	38	16	11	12	8	3	7		6		95	58
51 - 60	2	4	44	38	43	32	25	15	20	3	3	3	3	1	140	96
41 - 50	2	1	20	17	52	41	34	16	19	11	9	4	12	5	148	95
31 - 40		1	11	12	43	24	26	18	27	8	12	8	10	4	129	75
21 - 30			1	4	4	8	5	6	2	2		2	3	1	15	23
11 - 20			1		1		3		1		1			1	7	1
N	6	6	146	107	212	136	115	71	80	27	34	12	35	12	628	377
Mean	60. 50	50. 5	61. 25	54. 94	53. 61	50. 65	48. 71	48. 50	46. 87	44. 39	47. 85	42. 73	46. 07	38. 33	52. 96	50. 27
SD	12. 50	7. 63	15. 29	12. 93	15. 24	13. 77	14. 60	14. 10	12. 32	10. 65	14. 15	13. 66	12. 86	10. 27	15. 60	13. 76

(C) RURAL AREA - V SCORE

Class / Inter/ -val/ Sex	11+ B	11+ G	12+ B	12+ G	13+ B	13+ G	14+ B	14+ G	15+ B	15+ G	16+ B	16+ G	17+ B	17+ G	Total B	Total G
46 - 50									1		1		1		3	
41 - 45			3	1	8	1	7		4				1		23	2
36 - 40			6	2	10	6	15	6	5	1	7	3	3		46	18
31 - 35			7	7	19	7	16	11	13	3	4	3	10		69	31
26 - 30			8	5	16	8	26	7	17	4	12	2	12	2	91	28
21 - 25	1		8	2	24	15	23	10	16	9	6	6	8	2	86	44
16 - 20			10	5	7	5	14	5	9	9	8	1	4	2	52	27
11 - 15			4	1	4	1	6	1	8	4	3		4	2	29	9
6 - 10						2			1			1			1	3
1 - 5						1										1
N	1		46	23	88	46	107	40	74	30	41	16	43	8	400	163
Mean	23		26.70	27.78	28.74	25.94	27.9	27.63	26.45	22.33	28.90	25.06	27.43	20.50	27.51	26.89
SD	0.0		8.69	7.73	6.26	8.51	7.97	7.10	8.58	6.42	8.23	7.95	7.87	5.59	8.20	7.81

(C) RURAL AREA - Q SCORES

Class Interval / Sex	11+ B	11+ G	12+ B	12+ G	13+ B	13+ G	14+ B	14+ G	15+ B	15+ G	16+ B	16+ G	17+ B	17+ G	Total B	Total G
46 - 50											1				1	
41 - 45			1		3			1							4	1
36 - 40			4		3		5	1	8		1	1	4		25	2
31 - 35			10	1	10	4	16	3	7	1	4		4		51	9
26 - 30			13	6	16	7	18	6	11	1	8	3	11	1	77	24
21 - 25	1		12	9	34	12	32	14	24	7	13	4	13	2	129	48
16 - 20			6	5	13	11	30	12	18	12	11	3	10	3	93	46
11 - 15				1	4	11	6	1	6	8	3	5	1		20	26
6 - 10				1		1		2		1				2		7
N	1		46	23	88	46	107	40	74	30	41	16	43	8	400	163
Mean	23.0		27.67	22.26	24.76	20.72	24.07	22.51	24.28	18.33	23.85	20.81	25.21	18.00	24.77	20.95
SD	0.0		6.20	5.50	6.62	6.49	6.41	7.23	7.07	5.16	6.98	7.07	6.32	6.61	6.70	6.55

(C) RURAL AREA - TOTAL SCORES

AGE - GROUP

Class Interval / Sex	11+		12+		13+		14+		15+		16+		17+		Total	
	B	G	B	G	B	G	B	G	B	G	B	G	B	G	B	G
81 - 90			1		2		1		4		2		1		11	
71 - 80			3		7		9	3	6		1	1	4		30	4
61 - 70			9	7	15	5	20	5	6	1	7	3	6		63	21
51 - 60			10	6	19	12	25	9	20	4	8	3	11		93	34
41 - 50	1		10	6	33	14	31	13	19	9	14	6	15	4	123	52
31 - 40			11	2	11	14	16	9	14	12	7	2	6	2	65	41
21 - 30			2	2	1	1	5	1	5	4	2	1		2	15	11
N	1		46	23	88	46	107	40	74	30	41	16	43	8	400	163
Mean	45. '5c		51. I6	51. 59	52. 89	46. 80	52. 05	49. 16	51. 18	40. 83	50. 87	50. 50	53. 18	38. 00	52. 15	48. 03
SD	0.0		14. 24	12. 42	12. 65	10. 34	13. 40	12. 83	15. 25	9. 92	13. 99	12. 75	12. 55	8. 29	13. 69	12. 02

APPENDIX G

INTERCORRELATIONS AMONG SUBTESTS OF AAT & SCAT

(A) AAT Subtests (N = 200)

	I	II	III	IV
I Vocabulary	-	.345	.491	.341
II Computation	.345	-	.259	.634
III Sentence Completion	.491	.259	-	.351
IV Quantitative Reasoning	.341	.634	.351	-

(From S.K.V. Liddle, Table VIII, p. 93)

(B) SCAT Subtests (N = 2295 in Grade 9)

		I	II	III	IV
I	Vocabulary	-	.42	.83	.53
II	Routine Computation	.42	-	.46	.61
III	Sentence Completion	.83	.46	-	.57
IV	Arithmetic Reasoning	.53	.61	.57	-

(Above data collected in Experimental Program of SCAT are derived from the Technical Report, Table 3, p. 7).